BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	
	)	
Implementation of Alternative and	)	Docket No.
Renewable Fuel and Vehicle	)	08-ALT-1
Technology Program	)	
___________________________________	)	

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

TUESDAY, SEPTEMBER 2, 2008

9:21 A.M.

Reported by:
Peter Petty
Contract No. 150-07-001

CEC STAFF PRESENT

Michael Smith

Peter Ward

Gerry Bemis

Chuck Mizutani

Tim Olson

Malachi Weng-Gutierrez

Pilar Magana

John Margolis

ADVISORY COMMITTEE MEMBERS PRESENT

Michael Walsh
International Council on Clean Transportation

Tim Carmichael
Coalition for Clean Air

John Shears (via teleconference)
Center for Energy Efficiency and Renewable Technologies

Bonnie Holmes-Gen
American Lung Association of California

Patricia Monahan (via teleconference)
Union of Concerned Scientists

Jim Sweeney (via teleconference)
Precourt Institute for Energy Efficiency
Stanford University

Dan Kammen
Renewable and Appropriate Energy Laboratory (RAEL)
Berkeley Institute of the Environment
University of California, Berkeley

Carla Din (via teleconference)
Apollo Alliance

ADVISORY COMMITTEE MEMBERS PRESENT

Will Coleman (via teleconference)
Mohr Davidow Ventures

Jay McKeeman
California Independent Oil Marketers Association

Tom Cackette
California Air Resources Board
California Environmental Protection Agency

Anthony Brunello
California Air Resources Board
California Resources Agency

Richard Shedd
Department of General Services

ALSO PRESENT

John Boesel, President and CEO
(via teleconference)
WestStart-CALSTART

Gina Gray (via teleconference)
Western States Petroleum Association

Danielle Fugere (via teleconference)
Friends of the Earth

Michael Jackson (via teleconference)
TIAX, Inc.

Tom Fulks (via teleconference)
Neste Oil
Mighty.com

David Modisette (via teleconference)
California Electric Transportation Coalition

Andrew Panson (via teleconference)
California Air Resources Board

Bonnie Scott
Global Cooling Solutions

ALSO PRESENT

Walter Seimbab (via teleconference)
South Bay Cities Council of Governments

Jon Van Bogart
Clean Fuel USA

I N D E X

P R O C E E D I N G S

9:21 a.m.

MR. SMITH: Okay, we're going to go ahead and start this workshop. My name is Mike Smith; I'm the Deputy Director for Fuels and Transportation here at the Energy Commission. And pardon the delay getting this started, particularly for those who are on the phone and on WebEx. We thought it wise to at least give some folks a few minutes. Traffic was a bit of a headache this morning. Everybody's coming back from Labor Day weekend, school is starting, college is starting and I'm sure nobody has planned ahead for the commute. So, I wanted to give folks just a few minutes for those that might be traveling a little bit late. But we're going to go ahead and get started now.

What I'd like to do first is go around the table to introduce the members of the Committee that are here present. And then I know there are some folks online that are committee members, also, and after we go around the table I'd like those folks to take a minute just to identify themselves so we know exactly who of the committee membership is listening and participating online.

Peter, do you want to introduce yourself.

MR. WARD: I'm Peter Ward, Program Manager for the AB-118 program here at the Energy Commission.

MR. CACKETTE: Tom Cackette from the Air Resources Board.

MR. BRUNELLO: Tony Brunello from the Resources Agency.

MR. WALSH: Mike Walsh, consultant.

MS. HOLMES-GEN: Bonnie Holmes-Gen, American Lung Association of California.

MR. CARMICHAEL: Tim Carmichael with the Coalition for Clean Air.

MR. SHEDD: Richard Shedd, Department of General Services.

DR. KAMMEN: Dan Kammen, University of California at Berkeley.

MR. McKEEMAN: Jay McKeeman, California Independent Oil Marketers Association.

MR. SMITH: Thank you. Advisory committee members online, could you identify yourselves one by one?

MR. COLEMAN: Will Coleman, Mohr Davidow

Ventures.

DR. SWEENEY: Jim Sweeney, Stanford University.

MR. SHEARS: John Shears, Center for Energy Efficiency and Renewable Technologies.

MS. DIN: Carla Din, Apollo Alliance.

MS. MONAHAN: Patricia Monahan from the Union of Concerned Scientists.

MR. SMITH: The person before Patricia was a bit garbled. Could you repeat yourself, please?

MS. DIN: That may have been me, Carla Din.

MR. SMITH: Oh, Carla; hi, Carla, how are you? I'm sorry I didn't hear your name clearly.

Is there anybody else online that's a member of the advisory committee?

Okay. With that we'll get started. This is the third advisory committee meeting of the alternative and renewable fuel and vehicle technology program.

This one's a little bit different. This is a staff workshop as opposed to a committee meeting sponsored by the Energy Commission's

Transportation Committee.

Following the last advisory committee meeting of our Transportation Committee members, Commissioner Jim Boyd and Karen Douglas asked staff to meet informally at a staff workshop level with the advisory committee to present to them and discuss with them and work through any issues with you folks on our revised methodology for the investment plan.

And that will be the focus of today's workshop. And I'll go into it in a little more detail in just a minute.

We are planning a second staff workshop with the advisory committee on September 15th, which is a Monday, my apologies. That will be about 15 days, just about two weeks from now. As I said it's another staff level informal meeting to work through and discuss with you folks our methodology.

The next formal advisory committee that will be sponsored by the Transportation Committee by Commissioners Boyd and Douglas will be on October 6th.

There is a notice on the September 15th workshop that was posted on Friday, so there is a notice on the website if you care to take a peek at that. But just to give you a heads-up as well as stakeholders and members of the public, that we will be having another meeting in mid September.

MR. CARMICHAEL: When was that?

MR. SMITH: September 15th, yeah.

I want to apologize in advance to the committee members and to the stakeholders and members of the public in general for not having materials for your review prior to this meeting.

Unfortunately we didn't have materials and didn't have the methodology finalized in time to send it to you in advance so that you could review it in any meaningful way and come prepared. So my apologies for that.

So the material we will be presenting today you'll be hearing about and seeing for the first time. It makes the September 15th workshop all the more imperative because it will give members of the advisory committee a second bite at the apple to react to our methodology and the process that we are going to undertake in developing the revised investment plan.

So you'll have a couple weeks to think about it and come back to a second meeting more prepared to engage. But we wanted to at least take this opportunity to keep the process moving forward, take this opportunity to present the methodology to you for your consideration.

MR. CARMICHAEL: Could I just --

MR. SMITH: Tim, go ahead.

MR. CARMICHAEL: This is Tim Carmichael. If I could just flag something. Bonnie and I were just caucusing. There's, we think, a pretty big conflict for a number of the environmental participants in this advisory group on that day.

CAPCOA is hosting their annual conference that Monday and Tuesday. And I know a number of people are planning to attend that. So I don't know if there's any flexibility on the 15th, but at least a number of the environmental advocates may not be able to participate in this advisory group meeting.

MR. SMITH: Okay, thank you for that --

MR. WALSH: I'm scheduled to be there, as well.

MR. SMITH: Okay. Thank you for raising that. We'll check into optional dates. If you could provide us with some optional dates that perhaps work for you, that would help us, also.

But we'll certainly see what flexibility there is.

So there may be a change to the notice then that's up on the website. We want to try and do this with as much participation as possible, so we'll look very carefully at that.

Let me just give a very brief overview, and then I'm going to turn this program over to Peter Ward to walk you through in more detail. And then ultimately to Gerry Bemis and to Malachi Weng-Gutierrez, who will talk in more detail about the methodology that we've developed.

Essentially we heard from the advisory committee members at the last advisory committee meeting regarding the depth and breadth of the draft investment plan that we presented. We took those comments very seriously; went back to the drawing board and prepared a more goal-driven process or methodology to act as sort of the centerpiece of the investment plan, itself.

We are basing the methodology on the 2050 vision statement and materials that underlie the 2050 vision statement in our alternative fuels plan. And just as a reminder, that was the plan that was adopted by the Energy Commission and the Air Resources Board last December, December 2007.

We've developed a year-by-year assessment penetration methodology for alternative fuels into the marketplace. What we will arrive at is a contribution, relative contributions to reducing greenhouse gas emissions in California by various types of alternative fuels.

As you will see in our presentation there's a number of questions that we are still wrestling with in putting together an allocation for the funds in the program, and we would seek input from the advisory committee and from the stakeholders and the public in general on some of the outstanding questions that we are still trying to incorporate into our methodology.

But very briefly, though, once we arrive at a determination of greenhouse gas reductions for fuels, we are also we will add, reflect to that, a gap analysis that was discussed at the last advisory committee meeting. And we have engaged the services of TIAX to help us with that. And Michael Jackson is here today to present their preliminary findings on the gap analysis.

But that will help us identify holes in the market for funding for alternative fuels and vehicle technologies. But that's not the complete picture because what we also want to do is look from the industry side and get their input on where, given the gaps in funding, where the Energy Commission could most effectively use its money in supporting the entry of alternative fuels and vehicles into the marketplace.

And I think with that I'm going to turn this over to Peter who will give you a little more detailed perspective; and then ultimately to Gerry and to Malachi. Thank you. Any questions before Peter begins?

Thank you.

MR. WARD: Good morning, everybody, and thank you for coming and thank you for being on the phone, those of you who are on the phone. I appreciate your participation and we're looking forward to your advice as we move forward on the investment plan and this methodology which we'll describe today.

Some of the housekeeping. The restrooms are right across the atrium from us. If we are required to evacuate there are two doors, one to the left, one to the right. If that happens you'll see a monitor out there with a hardhat directing you to one of those. Hopefully that won't happen. And if that happens, people on the phone, you can just sort of sit back and wait for us to come back.

We today are operating on WebEx today, so those that have questions can register your questions. And for those in the room, I'm not sure we need blue cards. Maybe just raising hands. This is a little bit more informal than the advisory committee meetings we've had in the past. And we seek your input along the way.

So as we go through, especially Gerry and Malachi and perhaps Mike Jackson's presentations today I'd like to ask you if you have a clarifying question, something that's not clear as we go along, please go ahead and ask it, or raise your hand at that time.

If it's more of a discussion-type question that could go protracted, if we could hold those till the end of those presentations that would be appreciated.

Again, thank you for those advisory members that are on the phone. And also I'd like to recognize our counterparts, our colleagues from the ARB that are here for the 118 program, Andy Panson and Johanna are here with us, today, as well. Appreciate your coming.

The agenda for today is here. It includes some of the analysis now underway in preparation for the investment plan. It will be a little bit -- much more detailed than we had in the past.

We'll also briefly discuss the reverse engineering from 2050 to 2020 and to 2008 timeframes. The gap analysis, as Mike mentioned, Mike Jackson, I believe, will be on the phone with us today. I don't think he'll be here with us. Updating the fuel and technology storylines is key to the reverse engineering and the gap analysis that we've identified.

So we're still in the process of updating those storylines from the different fueling group that we utilized in the AB-1007 alternative fuels plan procedures that we had. And a lot has happened in the last few years, but we'll go into that a little bit more later.

Also be going over the new schedule for the investment plan. We've delayed a bit, and the status of regulation development, the funding priorities and the opportunities. And then we'll have time at the end for public comment.

I'm going to be going fairly quickly through this because I want to allow as much time as we can for the detailed analysis that Gerry, Malachi and Mike Jackson have prepared.

At the July 9th meeting we received many comments on the draft plan. As a matter of fact I think we had some unanimous comments, if not unanimous maybe would be held to a voice vote, certainly it was a bit overwhelming. I think that in an advertent way the plan and my presentation of it had a unifying effect for the advisory committee in that way.

(Laughter.)

MR. WARD: I'm very happy to be a uniter. And there's that new word, again, that we're all familiar with.

But basically here's what I heard, and I've heard from my discussions with several of the members in the intervening time. We will be coordinating, and we already have begun the tighter coordination with the PIER alternative fuels roadmap process. And we are already exploring areas where we can potentially interact and jointly fund projects possibly.

We will be guided by the full fuel cycle analysis. And we have committed, as I mentioned in the last meeting, that we are committed to updating the inputs to GREET as we go along, and throughout this program, I think that is our definite and steadfast commitment to do so.

The goal-driven methodology for allocating funds will be to describe later today. We are right in the midst of that. I want to caution you we ar not -- this is a work in progress. And to a certain degree it probably will be for a period of time. I think we'll have a brief final project product. But then after the first year I think we are, of course, committed to updating that as needs require.

And discussion about capital efficiency, one of the topics that Will Coleman mentioned in the previous meeting. Reverse engineering that you folks requested and that we are about the business of doing to get to the 2050 GHG reduction targets.

The gap analysis that TIAX has prepared. I think we're going to be adding possibly to that, as we'll hear a little bit more about that later.

We were asked to emphasize economic development and workforce training which we will pose this as questions to the group, as well.

And we are committed to continuing the sustainability market and incentive studies throughout the program.

So I really think that this will be one of the best informed programs going forward. We understand our place in time and our place in the country, as a state, and in the world as a nation-state, if you will. And so we do take this work quite seriously. We think that this is one of the best examples and we want to make it turn out that way.

The overview of the investment plan process. This is the context for our program, and of course the goal of this program is to develop and deploy innovative technologies that transform California's fuel and vehicle types to attain the state's climate change policies. That's our over-arching goal.

We know that AB-32 has, in statute, the goal of 20 percent below 1990 levels by 2020. And the Governor's executive order states 80 percent below 1990 levels by the year 2050. And, of course, that is the ultimate goal that we're hoping to attain, not just the 2020, but to also describe the trajectory that we would pursue from 2020 to 2050.

GHG reduction for the transportation sector is approximately 38 percent of the total emission reduction needed to achieve the 2020 and 2050 emission reduction targets.

Further context. We also will be trying to intersperse the state alternative fuels plan and the goals from that plan, which were to achieve alternative fuel use of 9 percent by 2012, 11 percent by 2017, 26 percent by 2022.

In addition, the bioenergy action plan specifies instate biofuels production of 20 percent by 2010, 40 percent by 2020 and 75 percent by 2050.

The investment plan process. As we go forward we'll describe the categories of funding that will be eligible to receive funding of the program. And we'll prioritize these categories assigning each a percentage of the available funds based primarily on the GHG reduction potential. That is the guidance that we received from you in the past, and that's what we're going forward with at this point.

In essence, the greater the assigned

percentage of available funds, the greater the potential to reduce GHG emissions.

We may incorporate other considerations in determining the final percentage allocation of available funds and funding opportunities. These are going to be listed later, and they do not necessarily directly relate to the emission reduction potential in GHG. These are like workforce training, economic development and the like. I'll go through those a little bit more later on in the presentation.

The investment plan is adopted by the Energy Commission. All funding decisions will be consistent with the categories and allocations determined by this process and in the investment plan.

Further overview of the investment plan process. We are committed to the use of the California modified GREET model to use the assumptions of findings that were prepared for the AB-1007 state alternative fuels plans and the 2050 vision, which was an integral part of that state alternative fuels plan to better understand the fuel, technology and market changes that would be necessary beyond 2022 to achieve the 80 percent

GHG reduction goal for transportation sector by 2050.

As I mentioned earlier, we'll be updating the storylines for market penetration. Participants in the state alternative fuels plan with fuel and technology working groups we will help understand what changes may have occurred during the last two years. And that is for the update for this plan. But going forward, we plan to stay closely in touch with the alternative fuel working groups and the vehicle technology development groups, as well, so that we can, again, inform this plan in the best possible way as we go forward year to year.

This is going to be really critical information. This is basically where the market is out there and how we can balance the available funds to the opportunities that we see out there.

Bonnie?

MS. HOLMES-GEN: How does that -- so when you're saying that the 2050 vision was added, I mean can you give a little more clarification of what you mean? Just that that specific goal is now incorporated into the work that you're doing?

MR. WARD: The 2050 --

MS. HOLMES-GEN: Or that it --

MR. WARD: -- vision was added to the state alternative fuels plan. It is therefore part of what we're planning on going forward. It was not --

MS. HOLMES-GEN: Okay, so the --

MR. WARD: -- initially described in the statute of AB-1007. And it was added so that we could be looking toward 2050 in the state alternative fuels plan.

MS. HOLMES-GEN: So the specific elements in that chapter of the report are now incorporated into what we're doing here?

MR. WARD: That's right.

MS. HOLMES-GEN: Okay.

MR. WARD: You'll see that the analysis that we have is going all the way out to 2050 and trying to reverse engineer back to the 2022 and the present, basically, to make sure that we are on the trajectory that was outlined in the 2050 vision to meet the 2050 goals of 80 percent reduction.

I think the storylines pretty much speak for themselves. I know the last investment plan had citations at the end for each one of those, well, those will be updated and probably -- hopefully provided very soon to you all, as well, so that we can have a snapshot of where all those fuels and vehicle technologies are right now; where they can be; and what would be needed for them to achieve a higher market sector.

Addressing the goals in the investment plan. These are goal-driven assumptions in 2050 vision; include 2050 fuel mix for light-duty vehicles. This is right out of the 2050 vision in the state alternative fuels plan. And fuel mix for light-duty vehicles, I should mention, also, that the 2050 vision really was for light-duty vehicles only, not medium- and heavy-duty. But we'll address that later as we are expanding our analysis to potentially include medium- and heavy-duty vehicles, as well.

They remain electricity and hydrogen vehicles at 40 percent; biofuels at 30 percent; and a third category, including combination of petroleum, natural gas and propane vehicles of 30 percent.

In the investment plan we evaluate the following categories which are very very similar. The super ultra-low carbon is comprised of fuel cell, plug-in hybrid, electric and battery electric vehicles that achieve a 90 percent GHG reduction relative to petroleum fuels, and have a fleet average of 80 miles per gallon.

The ultra-low carbon is comprised of fuel-flexible vehicles that operate on biofuels and achieve an 80 percent GHG reduction. One would assume there that would be totally a cellulosic biofuel, or a biofuel of the future generation two or three, for the 80 percent GHG reduction, relative to petroleum fuels, and have a fleet average of 60 miles per gallon.

And the nonrenewable fuel alternatives. Basically this is the segment of 30 percent that includes natural gas, propane and petroleum fuels that also achieve a fleet average of 60 miles per gallon, as well.

MR. CARMICHAEL: Peter, a question.

MR. WARD: Um-hum.

MR. CARMICHAEL: Just connecting dots that I hope should be connected but I'm not sure, between this slide at the top where you talk about biofuels representing 30 percent in 2050, a couple of slides ago you talked about the bioenergy action plan with a 75 percent biofuel goal by

2050.

Are we on the same scale, and is the balance going to medium- and heavy-duty vehicles? Or are they not apples and apples?

MR. WARD: If I didn't state it, the bioenergy goals are for California-produced biofuels. So the 75 percent, of all the biofuels we would be using at that time, the goal is to produce 75 percent of that in California.

MR. CARMICHAEL: Thank you.

MR. WARD: Sorry if I missed it.

MR. CARMICHAEL: Thank you.

MR. CACKETTE: I just want to also make it clear to folks that these numbers you've got up here are fuel use.

MR. WARD: Um-hum.

MR. CACKETTE: The actual number of vehicles that would be in these mixes differs significantly because of different fuel efficiency, I think.

For example, I think the 30 percent of the fuel that's burned by nonrenewable alternative fuels or petroleum is actually only about 10 percent of the vehicles in actual --

MR. WARD: Right.

MR. CACKETTE: -- total vehicles.

MR. WARD: Right.

MR. CACKETTE: So when you look at the vehicle mix, for purposes of --

MR. WARD: Um-hum.

MR. CACKETTE: -- funding it will be substantially different.

MR. WARD: That's right. And I think Gerry will address that in his. He has a slide specifically on the vehicles -- on the emissions and on the fuel use, as well. So, I think he's characterized all of these things. I think it will address your question when he comes up.

DR. KAMMEN: Just one more, if you have a second?

MR. WARD: Sure, um-hum.

DR. KAMMEN: For the electric and for the hydrogen planning process, is there kind of a formal link to the work that the ISO is doing? Because right now they're involved in a roadmapping plan to think about being the 2020 RPS and beyond.

And to try to take advantage of that work it strikes me that there's some really critical issues in terms of upgrading transmission lines, and also potentially getting into the new ones that may be needed if one wants to aggressively meet those goals.

From the analysis that we're doing I suspect that's actually one of the most critical issues to the long-range plan. And I'm just not sure if that is formally being done at the state level or not right now. In terms of building the infrastructure costs into your models based on some of the work that they're supposed to be doing right now.

MR. WARD: We haven't. We'll take your suggestion, though. And I note that you'll be presenting a paper relative to that. And I'll address the subject probably more thoroughly a little bit later.

But I'll note that and I definitely want to cover that, make sure that the ISO is included in our projections, as well.

Any other questions?

MS. DIN: Peter, this is Carla Din. How did you reach the 75 percent figure regarding (inaudible)?

MR. WARD: Those goals were -- basically came out of the bioenergy action plan, as I understand it. It was the Governor's executive order based on the work that was done in the bioenergy action plan of about two years ago, I think.

These are goals that we're hoping to provide an economic benefit for California. Obviously that we would be more self-sufficient as a state if we could produce up to the 75 percent of the biofuels we use in the 2050.

MR. SMITH: Carla. This is Mike Smith. Those figures were developed, as Peter says, and incorporated in the bioenergy action plan, but they came out -- the bioenergy action plan was developed by the interagency bioenergy working group which is comprised of the Energy Commission, the Air Resources Board, PUC, Food and Ag, other state agencies that have some responsibility in state government for bioenergy.

The working group decided, for purposes of the bioenergy action plan to come up with production goals as opposed to use goals in California. So the bioenergy action plan that was submitted to the Governor and the resulting executive order that he signed reflects production goals.

I think the desire there is that the state is going to rely increasingly on biofuels rather than import fuels either from the midwest or from foreign sources.

There's enough resources in California that we can begin producing, developing our own industry in California.

That was essentially the genesis of those numbers.

MS. DIN: Thank you.

MR. SMITH: Sure.

DR. SWEENEY: This is Jim Sweeney with just a quick question. When you use things like 80 miles per gallon for fuel cell vehicles, or 60 miles per gallon for natural gas vehicles, is this meant as gasoline equivalent? And are you using electric -- just the gasoline used, or the gasoline/electricity combination? How are you defining these numbers?

MR. SMITH: Jim, it's meant as gasoline gallon equivalent. And Gerry Bemis can answer that question in more detail in his presentation.

DR. SWEENEY: Okay.

MR. SMITH: Okay. Thank you.

MR. WARD: Thank you. Any other

questions?

THE OPERATOR: We have one (inaudible).

MR. WARD: Okay.

MS. FUGERE: (inaudible).

MR. WARD: Daniel? Danielle?

MS. FUGERE: Hi. Can you hear me?

MR. WARD: Yes.

MS. FUGERE: Okay. I just wanted to make sure, are you naming -- ultra low carbon, is that intended to name the electricity hydrogen category?

You've got supra ultra low carbon, ultra low carbon and nonrenewable. And I just wanted to know how that fit into the first bullet.

MR. WARD: Yes. Those are in that first category.

MS. FUGERE: Okay, so when you say ultra low carbon, does that mean the biofuels? Or is this some type of separate category?

MR. WARD: Well, the biofuels would be the ultra low carbon, the second category, I believe.

MS. FUGERE: Okay.

MR. WARD: For the flexible fuel vehicles that operate on biofuels that are 80 percent GHG reduction, and 60 miles per gallon on a fleet average.

So that would be the ultra low carbon would be the biofuels.

MS. FUGERE: Okay, thanks.

MR. WARD: So I think they're pretty much in order as we have kind of addressed them, and given them slightly different names.

MS. FUGERE: Okay, thanks.

MR. WARD: Okay. Any other questions? I was advised that if we're answering a question from somebody that's on WebEx, if we could speak right into the microphone; they're having difficulty hearing us if we don't.

The sources and steps in the methodology are displayed here. The 2050 vision statement in the state alternative fuels plan focused on the light-duty sector, as I mentioned previously. The fuel demand forecast through 2030 was adopted by the Energy Commission in its 2007 Integrated Energy Policy Report.

The expected benefits of the Pavley regulations for new passenger cars sold in California beginning in model year 2009 are included. Zero emission vehicle mandate benefits are included. Low carbon fuel standard benefits are included. Tire efficiency program benefits are included. And the penetration of nonrenewable alternative fuels ultra low carbon and super ultra low carbon vehicles are all addressed in the analysis.

Yes, sir, Jay?

MR. McKEEMAN: Jay McKeeman, CIOMA. In the timeframe that we're going to put this plan together is it realistic to think that we're going to have a good understanding of what the low carbon fuel standard is?

MR. WARD: Absolutely. No, I'm being a little facetious. It is an evolving thing at this point. And I had a discussion with Dan a little bit. The information going into that, as well.

It is a complex issue. I'm sure not everything will be nailed down, but we are trying to use the low carbon fuel standard and these others to approximate the benefits that would be projected from those.

So I'm sure that not all the details are nailed down, but the expected benefits are fairly clear as they've been outlined in the Governor's executive order, as well.

Dan?

DR. KAMMEN: Could I just sort of get you to expand on that in terms of what aspect? Because two ways to think about this are one, that the LCFS isn't a big hit on this 40-year plan because it's a 10 percent or more by 2020. And then we would see what comes next.

Or you can say it's a huge deal because it's going to determine part of the methodology that feeds into this two-rate all fuels. And I'm just wondering which or any of these -- what's the biggest sort of sticking point you're thinking about, since we're involved in some of the analysis right now on the indirect land use, which is proving to be pretty tough.

MR. McKEEMAN: I guess in my mind I have a hard time understanding exactly how the low carbon fuel standard is going to be implemented. I haven't heard a lot of good discussion about -- I mean, I understand carbon footprinting; I don't understand how we're going -- if there are a wide variety of fuels that have a lot of different carbon footprints, how we're going to get those fuels into the marketplace and available to the customer.

There's a gap in my understanding of understanding about being able to designate certain, I mean fuels by their carbon footprint between the point of being able to designate them and the point of getting them to the customer. And how the marketplace is designed to do that.

MR. WARD: I think you're raising legitimate questions. For our analysis here we are using the expected benefit from the low carbon fuel standard. The Air Resources Board will be detailing how that will be achieved. And I don't think that's all complete yet.

So, maybe we have a little easier because we're just basically describing what is the projected benefit and applying it to our analysis to see how we should allocate funds for this program.

But the Air Resources Board will be coming up in a more definitive detailed plan on how that will be implemented. Is it January or so? First quarter of 09.

MR. McKEEMAN: I guess something that -- a reason that I'm here at the table is that if there are large-scale changes that are going to be needed in the fuel delivery infrastructure, those changes should be anticipated in spending plan, in the AB-118 spending plan. Or else a wish is not going to come true.

MR. WARD: Well, I think that's where the rubber meets the road actually, and I appreciate your mentioning that, because that is one of those practical concerns that we do have to weigh and balance as we go forward with our plan, as well.

Thanks for your comment, and keep after us to make sure we include that.

MR. SMITH: Jay, just as a followup. There also is an issue that reflects the importance of why this investment plan needs to be updated periodically. We're not going to have all the answers. And for purposes of our analysis at this point, we took a fairly simple trajectory of the benefits, or the compositional benefits that the low carbon fuel standard will provide to the fuel market between now and 2020.

When there is more information revealed from the Air Resources Board on their methodology and process, we will try to reflect that in the next iteration of this plan.

It's a dynamic process.

MR. McKEEMAN: Okay, thank you.

DR. KAMMEN: I don't want to belabor it, but just to be fair, though, I mean I think you're absolutely right that there's a lot of these issues that need to be clarified.

But Chevron and others, of course, have been commenting in detail, and I assume you have their sets of comments that have been really worked into some of the ARB's planning in terms of how is that lifecycle methodology going to play out, or fuels not only based on their origin but also on the transport and other aspects to bring them to market.

So, it's not like there's some surprise here. I mean, at least I hope what's evolving is -- if the metric is a lifecycle analysis, that is the details of that, but I think you're asking about the broad framework unless there's some surprise in the process.

It's hopefully one that's evolving in the back-and-forth dialogue around the LC invested, and particularly the material that's in the second point report, the policy one starts to highlight the thinking on that.

So I think -- hope the goal is not that

this seems like there's some surprise coming up. It's the details of how to work this through for all the different possible fuels.

MR. McKEEMAN: I don't think it's a surprise. I think it's more a concern of small businesspeople operating in an environment where it's being teed up for the major oil companies to take over their business. So that's kind of my position at the table.

MR. WARD: Thank you for that, Jay. And, Dan, I want to just make it clear that the Chevron comments you refer to are comments to the low carbon fuel standard --

MR. McKEEMAN: That's correct.

MR. WARD: -- process, and haven't been docketed here necessarily, but --

MR. McKEEMAN: That's right.

MR. WARD: -- to find them you'd go to the low carbon fuel standard docket. Okay.

MR. McKEEMAN: Correct.

MR. WARD: Any other questions?

The sources and steps of the methodology. As I mentioned, the 2050 vision was done for light-duty vehicles. And we have embarked on extending that to medium- and heavy-duty sectors, as well.

We will be relying on the transportation fuel demand forecast through 2030 from the Energy Commission's Integrated Energy Policy Report as the basis, extended to 2050.

And we'll be using the fuel composition effects of the low carbon fuel standard. And last is we will be assuming vehicle efficiency gains and adjustments to the land use impacts from the reduction in onroad light-duty vehicle miles traveled as reflected in the medium- and heavy-duty vehicle sectors by increased public transportation energy use.

The overview continues. We heard from the last meeting that we should be promoting a gap analysis, and we are doing that. We will be hearing from Mike Jackson of TIAX about that. And that gap analysis will determine the barriers of each fuel and technology basis and the level of funds being invested by state, federal and private sectors to address those barriers.

We think this is an important part. We, in the past, have always looked at the gaps, what is needed for each of these sectors to grow. But it's very important that we do this, that we are not duplicative of existing efforts either in the research and development or commercialization or by the fuel providers, themselves. They will have taken on some of these barriers, themselves, and we don't want to double-address those barriers, as well.

Developing the complete data on state, federal and private investments currently made to address these barriers as one of the inputs. The type of work needed to address those market barriers. And the status of that work.

The relative expense to complete this work and realize the GHG benefits is the area that we will be identifying and hopefully addressing in our program.

The gaps identified show where our funding will complement others, as well. Once these funding areas are identified we hope that through partnerships we can maximize the benefit of our program with the resources the others bring in that market sector. And in partnership and not be duplicative of their efforts, as well.

This is the overview of the investment plan of other things that we would be considering. Most of the program funds will be allocated based on GHG reduction. But other categories and considerations also come into play.

We seek your advice on how to allocate in these areas because they do not directly relate to the GHG reduction. We are interested in hearing from you beyond this analysis. And some of these areas are the vehicle efficiency technologies, workforce training, public outreach.

We will be allocating funds for studies of sustainability, markets and incentives on an ongoing basis.

And as Tom Fulks mentioned in the last meeting, we will have a category for way-cool things we didn't think of yet, which definitely will drive this program. We do see that those way-cool things may actually exist between research and development and commercialization. We would like to help in that area, as well.

But how we allocate funding for these particular areas we do seek your advice and counsel on at this point.

Mike.

MR. SMITH: Peter, just to clarify. On vehicle efficiency technologies we actually can calculate the GHG reduction benefits from the methodology that Gerry will explain. So we are in the process of doing that. It's a fairly simple process.

But the other categories are definitely categories that don't have a GHG foundation. And we will need some input on how to best allocate funds from AB-118 for those activities.

These are activities that are called out in statute, so it's important that we not embed them, but rather call them out specifically so we can allocate very explicitly funding for those efforts.

MR. WARD: Thanks, Mike. At this point if there are any other questions I'd like to take them now. Otherwise, I'd like to call on Gerry Bemis who has painstakingly taken us through from 2008 all the way out to 2005 -- or 2050, or 2050 back to 2008, depending on how you look at it.

This is a work in progress and we are very interested in your comments as we go forward and finalize this. This is his analytical method for, and our analytical method for allocating program funds for the AB-118 program.

Gerry.

MR. BEMIS: Peter, the agenda says Chuck

was on next. No?

MR. WARD: That's an older agenda at this point.

MR. BEMIS: Okay.

MR. WARD: Gina?

MS. GRAY: Yes.

MR. WARD: Gina Gray of WSPA. I recognize the voice.

MS. GRAY: Thank you. Sorry. Hopefully this is an appropriate time to ask a question. But a couple of slides ago where there was a discussion I think it was -- tried to figure out where these monies might go and how to allocate the funds.

And I can understand where you're trying to get a grasp of all the different programs in the state that may, you know, you may need to look at the goals and where the benefits need to be. And therefore try and allocate the funds into these various fuel groupings.

But I guess the problem I think I'm having is understanding how that then flanges up with what was in the documentation earlier where it talked about, for example, you know, that folks that have a mandate, in other words a piece of legislation or regulation that they're trying to comply with, would not be able to apply for those funds.

So, on the one hand it seems that you're taking into account the LCFS, et cetera, and the types of fuels that may be needed for those in order to create their carbon intensity reductions, but on the other hand the folks that are trying to comply with those are not being allowed to apply for the funds.

MR. SMITH: Gina, good morning. This is Mike Smith. Just to clarify the inclusion, and certainly Gerry can explain this in a little more details once he begins his presentation, but inclusion of the effects of the low carbon fuel standard are not intended as a measure of what might be eligible for funding from the Energy Commission.

We had to, in the process that we went through we had to start with a demand forecast, a business-as-usual demand forecast, and then layer by layer show the effects on demand of the Pavley regulations and the like.

Now, the low carbon fuel standard doesn't necessarily affect demand for transportation fuels. What it does is affect the composition of transportation fuels sold in California.

So we're just simply, what we're trying to do is sort of, in a sense, peel back the various layers of the skins of the onion to get down to that market or that demand for conventional gasoline and diesel that's going to be mostly affected or influenced by investments that the Energy Commission makes in its AB-118 program.

So we're only showing the effects of the low carbon fuel standard there as compositional effects on the market, not as double-counting, I think, as you may be suggesting.

Also we're certainly quite sensitive to the fact that the statute requires us, or prohibits us from providing funding for entities that are engaged in projects that are otherwise required by state law, federal law, local ordinances, et cetera, in complying with a regulation.

MS. GRAY: All right. I don't think I was implying double-counting. I just was trying to -- it seems to me just a disconnect between the derivation of the allocation of funds and then this exclusionary piece.

And I guess, again, one of our comments earlier had been it seems difficult to imagine any particular initiative within the state that isn't somehow tied to some piece of legislation or regulation.

In other words, people are going to be moving forward with PHEVs and with biofuel and with all these things because there are state regs that are in place that require certain things to happen. It's not happening in a vacuum.

And so I guess we're still struggling with this dichotomy, but I'll let you guys continue.

MR. SMITH: Okay.

MS. MONAHAN: This is Patty from UCS. Can I ask a question?

MR. WARD: Sure, Patty, go ahead.

MS. MONAHAN: And should we push the button that says raise-hand, is it better to just interrupt? I want to follow the right protocol, but I'm not quite sure what to do on the phone. Just is it okay to just interrupt, or should I -- I tried the raise-hand, but it seemed like it wasn't getting answered.

MR. WARD: The advisory committee members are unmuted, so speak right up.

MS. MONAHAN: Okay. Well, I had a question about the relationship between the investment plan and the regulations that are being developed as we speak.

And I'm wondering if you guys are going to devote any discussion to that today, or whether I should ask some specific questions around that, or actually perhaps more make some comments?

MR. WARD: We do have a section on the agenda today to give you a status of the regulation development. Maybe that's a good time to ask that question. Chuck Mizutani will be presenting that.

MS. MONAHAN: Okay, I can wait. And can I make a quick comment, then? I wanted to let you all know that a subset of folks on the advisory committee had drafted a letter, which I'm going to circulate to all members of the advisory committee so folks can have a chance to look at it and to sign on if they agree with the letter.

And basically it was a restatement of a lot of the issues. I think that you guys are pretty, are doing a pretty good job now of addressing, that came up in the last meeting of the advisory committee.

And they laid out some principles for the evolvement of the investment plan that number four. Let me go quickly through them.

Basically number one is to prioritize projects that meet the state goals, and that's the broad suite of state goals, including the 2050 vision, but also sustainability and air quality goals. And to develop end point for commercialization of high priority technologies and fuels. Sort of lay out a pathway for getting there.

The second one was to do a gap analysis, basically determine where we need public funding to achieve the targets, to achieve our goals.

The third is to insure transparency so that everyone, and I think, you know, both the community that's going to be applying for the funds, the business community, and also just the public, be clear that this should be a very transparent process for everyone concerned.

And the fourth is to fund priorities that still leave room for emerging technologies.

And I think you guys have also captured that well in the discussions.

And the letter also laid out a relationship that we expect between the regulations and the investment plan. And I'll go into that, I think, more when we actually have that part of the agenda.

But I wanted to say, you know, it seems like you guys are doing a pretty good job in addressing a lot of the concerns that we had laid out. And I'll be sure to forward this letter to you all, because I think so far only Commissioner Boyd and Commissioner Douglas have received the letter. But we'll circulate it to everyone.

And the folks that sign on the letter include Bonnie Holmes-Gen from ALA, Roland Hwang from NRDC, Daniel Emmett from Energy Independence Now, John Shears from the Center for Energy Efficiency and Renewable Technologies, Tim Carmichael from CCA, Coalition for Clean Air, Mike Walsh from International Council on Clean Transportation, Jan Sharpless, who we all well know is a former CEC Commissioner, Dan Kammen from UC Berkeley and Tom Frantz from the Association of Irritated Residents.

But we welcome sign on by others, and I apologize to those who didn't see a draft. We kind of put this together quickly and weren't able to vet it with everyone. And we wanted to make sure that this was done before the initial meeting.

MR. MIZUTANI: Patty, this is Chuck Mizutani. I'll be providing a status on the rulemaking proceeding. But on September 9th we will be holding a Committee workshop on the regulations that we had identified or discussed at the August 11th Committee workshop.

And then also we will be discussing the regulatory language with respect to sustainability goals on September 9th.

MS. MONAHAN: That's great, thank you.

MR. WARD: Thanks for your comments, Patty. Any other questions from the advisory committee?

Hearing none, I'd like to call on Gerry Bemis who has done his analysis and is anxious to share it with us. After Gerry, Malachi will be presenting his analysis that takes it to medium- and heavy-duty vehicles, as well.

Gerry.

MR. BEMIS: Good morning, everybody. I'm Gerry Bemis from the special projects office. And I will try to walk you through the process that I used to develop this methodology. And hopefully I can walk it along at a pace that's not too fast and not too slow. And if you need any clarifying information, please just go ahead and ask and we'll proceed with that.

Okay, I wanted to start with a little bit of context setting and talk about the emissions inventory that the Air Resources Board has developed.

You see here a pie chart for 1990 and a pie chart for 2004. Oftentimes you hear expressed that transportation emissions constitute 38 percent of the inventory, and that was true for 2004. Wasn't true in 1990. It was about 35 percent. So, it's growing.

What we're going to be talking about today, what I'm going to be talking about specifically is that medium-blue wedge, the 25 and 28 percent attributable to light-duty vehicles. Those are passenger cars and light trucks.

Malachi later will talk about freight and transit. And there's a little green wedge, that's other transportation, and that's marine and aviation. And the 62 and 65 percent is the remainder of the inventory.

I also wanted to show you this graph which shows the rate of growth relative to 1990. Everything here is indexed to 1.00, or 100 percent in 1990. The dark red line is the total inventory, including transportation. And you can see that it kind of went down a little bit in the mid-1990 years, as we had an economic downturn. And then proceeded upward from about 1996 out to 2004.

You can see also that the dark black line is total transportation which proceeded to rise faster than the inventory. And really, overall, the light-duty vehicles rose the fastest. So the fastest growing segment of the inventory is, in fact, light-duty vehicles. And the largest sector of the transportation sector, anyway, is light-duty vehicles.

If we were to extend that out to 2007 or 2008, to my knowledge, the inventory isn't prepared yet for that, but you would see probably that the light-duty sector was responsible for even more of the emissions.

Okay, Peter kind of gave you an overview of this, but what I was asked to do was to address this question. How can AB-118 funding be focused to put California's light-duty vehicle fleet, and I'm only looking at light-duty vehicles, on a path towards accomplishing an 80 percent reduction in greenhouse gas emissions. Oftentimes that's called our fair share of transportation.

The challenge I had was to work backwards from the 2050 vision in the state alternative fuels plan to find the starting point, that when proceeding forward, would lead to the outcomes as expressed in this 2050 vision. And I think Peter probably already summarized that for you, so I don't need to dwell.

So what I did was I began with the vehicle attributes from the 2050 vision. Again, Peter has already summarized this. Most vehicles get 60 miles per gallon on a fleet average. Electric vehicles, electric drive vehicles, which are the fuel cells, the plug-ins and the battery electrics, get an average of 80 miles per gallon across 15 vehicle sectors, vehicle classes, excuse me.

The electric drive vehicles, themselves, constitute 40 percent of the fuel mix. And biofuels are 30 percent; and the other fuels are about 30 percent. And, again, that's what Peter told you.

One thing he didn't mention was that the per-person VMT, vehicle miles traveled, is reduced from 10,300 under a distance-as-usual trend, to 8200 under the 2050 vision. And I actually used the 10,300, as I'll show you, to help project the forecasted fuel use out to 2050.

Okay, how did I extend that forecast out to 2050. I started with population data from the Department of Finance. They have, for every decade between 2020 - 50 estimates of population. It was a little bit larger than what I saw in the 2050 vision. The 2050 vision had 55 million in 2050, and the Department of Finance number was 59.6, if I remember correctly.

So I used the 59.6 number to compute total vehicle miles traveled from the business-as-usual case of 10,300 and got total vehicle miles traveled that way.

I chose to hold the fuel economy of the -- there's actually 45 vehicle classes in the CALCARS model. There's 15 vehicle classes that run on gasoline, internal combustion engines. Then there's 15 that are hybrid gasoline. And then there's 15 that are the same 15 again that are diesel. So, there's a total of 45 combinations of vehicles in vehicles classes.

I decided to hold the miles per gallon fuel economy at the 2030 levels out to 2050 to get the business-as-usual. And I extended the per-person VMT to 2050 by 10,300. And then likewise I extended new vehicle purchases.

Now, since I am controlling to the 10,300, and that's per person, then the number of new vehicles really is a tradeoff between miles per vehicle and number of vehicles. And I just chose, for simplicity sake, to extend that out. It doesn't make a difference arithmetically. If I did it the other way it would just mean more miles per vehicle.

I broke the fleet of vehicles into three groups. You heard a little bit about them. I called the first group the low carbon vehicles. Those are the ones that get 60 miles per gallon and 10 percent carbon reduction. That is, they meet the low carbon fuel standard.

The next I called ultra low carbon

vehicles. Those also get 60 miles per gallon. And they achieve an 80 percent carbon reduction. That comes right out of the 2050 vision.

Then there's the super ultra low carbon vehicles, and they get 80 miles per gallon and 90 percent carbon reduction. The 80 miles per gallon comes out of the 2050 vision and the 90 percent carbon reduction really comes out of chapter, whatever it was, chapter 3 of the document relative to fuel cell vehicles operating on biomass-derived hydrogen.

Later I break that down, but for now I'm talking about that as a group.

I wanted to show this slide next because it shows what are the fuel cycle greenhouse gas emissions relative to gasoline. This is from our full fuel cycle analysis that was done.

And you can see that LPT or propane and California diesel get about 20 percent reduction. There's a number of options I could have chosen that shows what are really kind of representative or maybe the best option from the appendices.

Hydrogen with onsite steam reforming is important; that gets about 58 percent reduction. These are reductions, not emissions. E-85 cellulose gets about a 72 or 73 percent reduction. And that really doesn't quite make the 80 percent, which was in the vision.

Then electric vehicles with night recharging looks like about 75 percent. And the hydrogen biomass is a little over 90 percent. These were values that I pulled off for the year 2030. And they're meant to be just representative of what is in that document.

Okay. Then after I developed business-as-usual, I added alternative fuel vehicle penetrations to the mix, using the storylines from the state alternative fuels plan as updated by staff.

Now, the emerging technologies office staff is responsible for updating those storylines. And all I did was use them. So if you have any questions related to the storylines, themselves, they should be directed to the emerging fuels staff. If you have questions related to how did I use it, it's appropriate for me.

The nonpetroleum alternative fuels were restricted to replacing gasoline and diesel in the low carbon class of vehicles, because their carbon intensity was too high to fit into the ultra low carbon or the super ultra low carbon.

Biofuels were used for the ultra low carbon, and SLU vehicles, because part of the fuel cells could be biomass fueled. And electric drive vehicles were all -- made up all of the super ultra lows.

Okay, now how did I do it. The next series of slides is intended to kind of walk you through how I extended the forecast out to 2050. The dark red line is total VMT per capita from the CALCARS model. CALCARS is a consumer choice model that we use to forecast light-duty vehicle gasoline and diesel demand.

MR. CACKETTE: Gerry, can I --

MR. BEMIS: Sure.

MR. CACKETTE: In the vision there's still some petroleum out in 2050. How did the -- I didn't see anything mentioned about the --

MR. BEMIS: It's in the low carbon.

MR. CACKETTE: That's in the low carbon --

MR. BEMIS: It's in the low carbon. Yeah, there is still some petroleum in, and you'll see some graphs that show it.

Let's see, getting back to this graph, so this series of graphs now is going to walk you through how I constructed the 2050 forecast.

The dotted green line is the projection. The number on the far right at 2050 is plotted at 10,300. And I extended it backward to match in with the red line, VMT per capita. And it shows a pretty linear fit, pretty straight line fit right there. I was very pleased with how that fit together like that.

The 8200 from the 1050 vision is also on the far right, plotted at 2050. And then I blended it back into really kind of by eye, to fit into about 2016. What I do later on is I take the ratio between the upper line and the lower lines to calculate the percentage of reduction in vehicle use as a vehicle is used. It's applied not to the model year of the vehicle, but to each year in which the vehicle is operated. So I have to take that ratio and apply it to each year of operation.

Okay, then I just extended out the population of new vehicles. The red line again is directly out of CALCARS and the projections are the dotted green line out. It's just shy of 4 million vehicles in 2050, 3.95.

Here's the result in terms of fuel consumption for gasoline and diesel light-duty vehicles. Dominated by gasoline, but diesel starts coming in. There were a few diesel vehicles in 2005 and earlier. It's not contained in CALCARS and they're really small compared to the total demand. So there's a little bit of brown dots, so small you probably couldn't see them, on the far left.

So this is what we're starting with, and this is the vehicle miles of travel. From this graph, starting to see some results. Here are the emissions for gasoline and diesel vehicles based upon the VMT we saw in the previous slide. And the emissions computed.

The upper red line is based upon getting -- I want to, I guess, clarify something Peter said. The goal for AB-32 is to get back to 1990, not 20 percent below 1990, by the year 2020. And so I extended this line horizontally out to 2020, plotted at the emissions of light-duty vehicles in 1990.

And you can see from that we still have a fair ways to go, even with business-as-usual.

This business-as-usual, as Peter did mention, does include the effect of the Pavley or Pavley-1, as some people might call it.

I also want to note that according to the ARB analysis, the Pavley-1 requirements, when translated into fuel economy, are as strict or more strict than the federal CAFE requirements adopted within the last year or two. So impliedly this includes the effect of federal CAFE changes in the last year or so.

The lower line, I don't know if you can read it or not, the lower line is the 2050 goal of an 80 percent reduction below 1990 levels. These are tailpipe emissions; these are not full fuel cycle emissions, they're tailpipe emissions taken directly out of the ARB inventory.

The challenge here, and it's a huge challenge, is to get the projected emissions for 2020 and for 2050 back to these red lines.

MS. MONAHAN: This is Patty from UCS. I have a very basic question which is why isn't there an increase in BAU emissions between let's say the full implementation of Pavley, when the fleet is turned over, and 2050? Why does it stay stable?

MR. MIZUTANI: It doesn't, it goes down.

MS. MONAHAN: I mean why isn't it going up?

MR. MIZUTANI: Why does it go up? In --

MS. MONAHAN: Why is --

MR. MIZUTANI: -- it --

MS. MONAHAN: -- since you have, since you're assuming increase in vehicle sales, and -- I'm just confused as to why it's not going up.

MR. MIZUTANI: It does go up in about -- it goes down because Pavley effects are greater than the growth, and so you have a reduction. And then growth comes on in around 2030.

MS. MONAHAN: Well, right, why isn't there an increase in global warming emissions from 2030 to 2050 in a BAU case?

MR. MIZUTANI: Yeah. Why does it level off, you're saying, in 2033?

MS. MONAHAN: Yeah.

MR. MIZUTANI: You know, I don't know. That's the way the numbers came out. I'd probably have to take a look at it to answer that question, if I take a look at it. It may be that we show a little bit too much in 2033 because of the way I treat the early vehicles, the 2005 and older vehicles have to be removed from the fleet of vehicles.

And I probably could do a better job at that. I did control to 2020 because of the CALCARS model, and I controlled to 2050. But little inundations in between in the mid 30s, I didn't really worry about. I think it's the legacy fleet.

MS. MONAHAN: But are you assuming the business-as-usual, that's the -- I guess I'm still confused. I mean between 2030 and 2050 you're going to have increasing VMT, increasing number of vehicles in California. And you said you're holding fuel economy stead. So all those facts indicate that it should be increasing emissions.

MR. MIZUTANI: Yeah, it might be that the mid 30s number should be a little bit lower, and that would show an increase if I lowered those down. I think that's what's happening.

MR. CACKETTE: I have another question. You show that the new car sales are essentially doubling over this timeframe, but the number of vehicles in the fleet and populations only go up by 50 percent. So what causes the number of new car sales to go up so dramatically?

MR. MIZUTANI: The new car sales I projected basically out of CALCARS.

MR. CACKETTE: I know, it goes roughly at 2 million or less now. And it would be setting those to 4 million --

MR. MIZUTANI: Just about 4 million.

MR. CACKETTE: -- in that same timeframe the population and the fleet number of cars, at least as I understand it, grow by about 50-some percent.

So it seems like there's --

MR. MIZUTANI: I don't know --

MR. CACKETTE: -- buy a lot more new cars than we have now, or something like that?

MR. MIZUTANI: I don't know. I don't know why, I don't know where your number comes from, for one thing, Tom.

MR. CACKETTE: Well, the population number is going from 35 million to 59 million.

MR. MIZUTANI: Right.

MR. CACKETTE: And the vehicle numbers go up slightly greater percentage than that. So 55 percent or something like that, but they don't double, which the new car numbers are doubling, so that's --

MR. MIZUTANI: Yeah.

MR. CACKETTE: -- something you might want to look at.

MR. MIZUTANI: Okay. Again, what I controlled to was the VMT per person. That's what drives the calculation is the VMT per person going to 10,300. And the number of vehicles, like I said, I could reduce, but that would mean that would increase the miles per car. And it would come out the same.

MR. CACKETTE: Well, it also means that you'd end up having a faster, when you get to the control scenario wouldn't it mean that you have a faster rate or slope towards getting towards the 2050 goal if you only have the new cars being sold going up by 50 percent?

MR. MIZUTANI: I don't think it would matter. Given the way that the calculations, I think it would come out the same. I'll check it, though.

Okay. The next slide I add the low carbon fuel standard. We had some discussion about this earlier and the way I did it was simple. I just linearly interpolated between 2010 and 2020, and decreased the carbon intensity 1 percent per year over that time period. And you see the additional reductions here.

It's up to Air Resources Board how to implement the low carbon fuel standard. And if they do it on the fuel side then it won't affect the vehicles. If it's an alternative compliance option that includes alternative fuel vehicles, those would have to be considered separate from the alternative fuel vehicle numbers that we're going to get to in a little bit later.

So I simply multiplied by carbon intensity to compute emissions for the effect of the low carbon fuel standard.

The next thing that I did -- and again the same thing, those goals are right here -- the next thing I did was to add the tire efficiency program assuming about a 10 percent reduction in 2010, a stepwise reduction. And you can see it as a little step down in 2010, actually if you look closely enough at that bar. Assuming about a 3 percent improvement for light-duty vehicles only.

And, again, we're getting closer now to the 2020 goal, but we're still quite a ways above, and we're way above the 2050 goal.

MS. HOLMES-GEN: Is this still only

considering tailpipe emissions?

MR. MIZUTANI: Yeah.

MS. HOLMES-GEN: Is there some point where you incorporate --

MR. MIZUTANI: Yeah.

MS. HOLMES-GEN: Okay.

MS. MONAHAN: Can I ask one quick clarifying question?

MR. MIZUTANI: Okay.

MS. MONAHAN: For the increasing penetration of diesel vehicles, are you assuming that we would actually capitalize on the fuel efficiency -- vehicles, or use something that is going to be met through a combination of gasoline and diesel?

MR. MIZUTANI: I used the computer model called CALCARS. I didn't use it, but my colleague did. And that has consumer choices over the 2005 to 2030 time period which includes increasing penetrations of light-duty diesel vehicles into the fleet based upon the choices people would make.

And all I did was hold the -- let's say, the market penetration, the market percentage of each of the vehicle classes, including diesel vehicles, constant. And that allowed me to take the information from the CALCARS model and put it into a spreadsheet.

And when I do that I lose some things and I gain some things. I gain the ability to play what-if stories. I lose the ability to take into account consumer choices, because that's been taken away.

So basically the consumer choices are really frozen at the 2030 values in CALCARS for diesel and gasoline. Did I answer your question?

MS. MONAHAN: Then I'm presuming that -- that California's actually going to see a benefit from increased dieselization in terms of a lower GHG profile, which I don't think actually ever played out in reality.

But, you know, that's probably a difference of the CALCARS modeling.

MR. WENG-GUTIERREZ: It's actually the efficiency that's pulling --

MR. BEMIS: Yeah, the comment that was made by Malachi who runs the CALCARS model is it's the efficiency effect.

Diesel has a greater fuel -- fuel use efficiency; it's a more efficient use of fuel, but it also has heavier carbon loading. So those two play off against each other.

MS. MONAHAN: Yeah, but usually not -- it still comes out as a GHG benefit if you increase the number of diesel vehicles. But in the real world we've never seen that sort of GHG benefit from dieselization. So, --

MR. MIZUTANI: Okay.

MS. MONAHAN: -- that's not a correct assumption. Basically you have to assume they're going to meet the standard and not exceed the standard by having more diesel vehicles in California.

I think the latter is not accurate.

MR. BEMIS: I don't think I made either one of those assumptions.

MS. MONAHAN: Well, I think the CALCARS model apparently has -- consumer choice where it says basically you're going to get a certain number of certain vehicle amenities and you can either (inaudible) you're going to get a 35 percent, some percentage of efficiency benefit. In fact, we're actually going to see, in California, as a benefit beyond the (inaudible) and I would say that's not likely the case.

MR. CACKETTE: Gerry, maybe I can --

MR. BEMIS: Go ahead.

MR. CACKETTE: I think I understand, but tell me if I'm wrong, too. It's the very top of the bars, top of the purple bars is what Pavley, for example, gets you which causes the decline. And then within the bars just CALCARS says how many of those vehicles are diesel versus gasoline.

But I mean there's nothing in CALCARS that implicitly says that you're going to get more than what Pavley requires.

MR. BEMIS: Right. The CALCARS model, maybe Malachi can explain it better. He's in the audience. But the CALCARS model is based on consumer choice, what people say they would buy if these models, these vehicles were available. If diesel vehicles were available with these characteristics, and fuel price is estimated to be this range, people would tend to buy this vehicle versus that vehicle.

MR. CACKETTE: But constrained so that it meets the Pavley requirements, the net sum of the vehicles, right?

This doesn't say that you're above Pavley or below Pavley, right? It says --

MR. BEMIS: Right.

MR. CACKETTE: -- that you're beyond Pavley.

MR. BEMIS: Right, yes.

MS. MONAHAN: Oh, is that the case? Because --

MR. CACKETTE: Yeah.

MS. MONAHAN: If that's the case then my question -- have no concern. But my understanding was that it actually did go beyond the standards.

MR. BEMIS: Malachi is in the --

MS. MONAHAN: -- misunderstanding --

MR. BEMIS: Malachi said yes, you are.

MS. MONAHAN: Okay, well, --

(Laughter.)

DR. SWEENEY: Okay, this is Jim Sweeney. I actually want to ask a related question. It looks like from these graphs that the low carbon fuel standard and the high efficiency program end up each reducing the carbon dioxide emissions, but if the Pavley bill is the constraint, I don't understand how adding in those changes -- because it's clear that the Pavley bill is not a fuel efficiency standard constraint, but a carbon dioxide emissions constraint. I don't see how adding those other programs actually has overall reduction in greenhouse gases in your model.

I mean, because once you do those things is when you're below the Pavley constraints, the Pavley constraints are no longer binding on the overall system.

So, how did you take into account that interactions between these other things and the Pavley as being a greenhouse gas constraint?

MR. BEMIS: Are you suggesting that the entire program could be used as a means of complying with the low carbon fuel standard?

DR. SWEENEY: Well, if the Pavley bill really is a statement about the fuel efficiency, that fuel efficiency, the carbon dioxide emissions of the vehicle -- and now you have less carbon in the fuels, or more fuel efficient tires, that, in fact, would mean you don't have to push in others. So, yes, I believe it would be a compliance mechanism.

MR. CACKETTE: Maybe you could clarify, is the tire efficiency program just new tires? Is it rolling resistance of replacement tires, or is it tire pressure? Because two of those three do not have to do with the directly with Pavley and one --

DR. SWEENEY: Right.

MR. BEMIS: Well, I assume it was additive. I assumed that these are totally independent and that could be wrong. But I assume that they were --

MR. CACKETTE: -- tire pressure --

MS. MONAHAN: So, it's replacement --

(Parties speaking simultaneously.)

MS. MONAHAN: So, it's a replacement tire program.

DR. SWEENEY: If it's just the replacement tire program, I agree, it's not compliance. But the low carbon fuel standard, as I understand how Pavley's written, if there was less carbon in the fuel, then that would be a compliance option for the Pavley bill, because the Pavley bill is strictly a carbon dioxide emission standard.

MR. CACKETTE: Yeah, Jim, this is Tom Cackette, ARB. That's true probably to a great degree in the Pavley program in that, for example, if you did ethanol -- this is before the land use issue -- you'd get a 26 percent credit off your GHG emissions for running that vehicle on E-85 for example.

So, yeah, it does, right now as it's set up, since there is no low carbon fuel standard, per se, on the books yet, it has the opportunity to have double counting. That's something that will get fixed in Pavley-2 once the low carbon fuel standard and other requirements are adopted into the regulation. We'll sort them out so that they don't have the carbon they're double counting, or if there is double counting at least it will be explicitly acknowledged.

DR. SWEENEY: Okay. So this is assuming that there's going to be new legislation that's called Pavley-2?

MR. CACKETTE: Well, not legislation, new regulation.

DR. SWEENEY: New regulations that essentially set -- okay, that's helpful. Because to me it looks like there was some double-counting given the overall system.

MR. BEMIS: We certainly want to avoid that, so I appreciate your comment. I did assume these were independent. And I guess maybe Tom Cackette is saying that if they aren't now they will be?

MR. CACKETTE: Well, I think it depends on how you meet the low carbon fuel standard since that's not understood yet. If you met it with biohydrocarbons blended into the fuel stock I'm not sure that Pavley would acknowledge that, and you probably would have to double count.

At the other end if you do it with alternative fuel of some kind, you get credit for the fuel right now, and it would be double counting.

MR. BEMIS: Yeah, well, I stated --

MR. CACKETTE: -- 2015.

MR. BEMIS: Okay, I stated the fact that if the low carbon fuel standard was achieved via fuel substitution by alternative fuel vehicles, those would have to be not included in the vehicles that we're talking about here. And that's what I meant.

Are we ready to move on?

DR. SWEENEY: Okay, well, I assume you'll think about it and make sure that you have that sorted out.

MR. BEMIS: Yeah, I'm very concerned about double counting, so I appreciate your comment.

DR. KAMMEN: The easiest way to do this for the whole group would just to be to produce a table that lists the mechanisms where they're counted and whether they are Pavley, beyond Pavley or whichever category.

And I would just have a table that lists each of the items in the model out, and then it's much easier for us to go through them. Especially at the next meeting where I think you'll get a second round on these.

MR. CACKETTE: Yeah, and I'd point out that the replacement tire program could be double counting because -- or at least not counted properly because if you use low rolling tires on the compliance vehicles, you build them that way as a new vehicle, I think the assumption right now is that that same tire stays on the car for the life of the car.

So the practice is replace them with high rolling resistance tires, then all that program does is bring us back to business-as-usual.

DR. SWEENEY: Yeah.

MR. CACKETTE: And that's not -- that is the assumption that's used right now, I believe.

MR. BEMIS: Okay.

MR. CACKETTE: In other words, if the vehicle emits 250 grams per mile of CO_2, and part of that is that reduction that got you there is due to low rolling resistance tires put on the vehicles that rolled off the assembly line, then the assumption is, I believe in the models, that it continues to have that 250. It doesn't go back up on the replacement tire.

MR. WENG-GUTIERREZ: Well, then the fuel economy of the aged vehicle fleet changes --

MR. BEMIS: Malachi's going to come to the mike and discuss that point for those listening in.

MR. WENG-GUTIERREZ: I just wanted to make one comment on that. The CALCARS model, the fuel efficiency numbers, you're right. The first tier does reflect the high efficiency tires that are on the OEM vehicles during the -- for the testing.

But the used vehicles and the aging of the fleet is incorporating into the fuel economy numbers for those vehicles as the forecast goes forward.

So new vehicles each year have a higher

efficiency than say a five-year-old vehicle. And that's the tire efficiency is a component of that.

MR. CACKETTE: You said higher efficiency, you mean higher fuel economy? Poor fuel economy.

MR. WENG-GUTIERREZ: Yes, yes.

MR. BEMIS: Tom, I'm curious, is there some kind of a -- will there be a regulation in place so that people, when they go about replacing the tires, will be required to replace them with fully equivalent tires that have the same rolling resistance as the OEMs put on the tires?

MR. CACKETTE: If we adopt one.

MR. BEMIS: If we adopt one.

MR. CACKETTE: -- your authority to --

MR. BEMIS: Yeah.

(Laughter.)

MR. BEMIS: I know, but I mean --

MR. CACKETTE: -- I believe.

MR. BEMIS: -- I'm wondering -- okay. That's what I'm trying to reflect here. What is the effect of that.

MS. MONAHAN: Yeah, I think it says -- 2 to 3 percent.

MR. BEMIS: I used 3 percent.

MS. MONAHAN: Yeah. I mean I think that's within reason.

MR. BEMIS: Okay. You know, I actually failed to mention earlier that I do take into account the degradation of vehicle use over time. A new vehicle may get 17,000 miles per year, but a vehicle that's one-year old may only get about 90 percent of that, et cetera, et cetera, et cetera, as the vehicle ages. I kind of passed over that point.

But I do have a decay rate that's supposed to reflect both a vehicle that's say retired, been in a collision and the insurance company has basically totaled it, quote-unquote. And vehicles that, as they get old, just aren't used as much.

Both those factors roll together into one what I call a decay rate, usage decay rate, that I used to calibrate the spreadsheet so that it exactly matches the CALCARS model output for the time period where I have data to compare, which is the 2005 to 2030 period.

Okay, now it starts to get a little bit more interesting. I added next on top of what we talked about before, which means the low carbon fuel standard and the tire efficiency program, what I call the ultra low carbon vehicles. Those are the ones that are flex-fuel vehicles, otherwise genericized it to call them ultra low carbon vehicles. And they're assumed to get 80 miles per gallon -- 60 miles per gallon, pardon me, correct that -- 60 miles per gallon, and they're assumed to get an 80 percent carbon reduction.

And that's the bright blue little bars that were added on the top here. We're getting pretty close to the 2020 goal at 108.5.

When I compute the ultra low carbon emissions this is where I'm assuming that that's life cycle, is coming out of our GREET model analysis. And the values represent life cycle.

We're still way above the 2050 value, as you can see on the far right.

Okay, so I had two ways of looking at the super ultra low carbon vehicles. This is work that's still sort of in progress. And so I'm going to show you two results for these super ultra low carbon vehicles.

First of all, before I do that, -- yeah, go ahead.

MR. CACKETTE: -- answer from the next slide.

MR. BEMIS: The next slide has to do with vehicles as percent of fuel use.

MR. CACKETTE: So you add in how many ultra low vehicles in this scenario? If it was all ultra low at some point, it's got to come down way more than that.

MR. BEMIS: This is --

MR. CACKETTE: -- fuel economy --

MR. BEMIS: Let's go to here. This is 33 percent of new vehicles in 2033, and 34 percent in 2050. This is kind of an interim step. This is not a final point.

I'm really -- I'm driving towards getting down to the 2050 numbers, and so this is just sort of like here's what we are right now. I didn't really try to maximize the reductions at this point.

Moving right along. Okay. This is the slide I wanted to get to. We add in the super ultra low carbon vehicles. That's the bright red vertical bars that we see. And this work is, like I said, still a bit in progress.

We get pretty close to the standard both in 2020 and in 2050. In this calculation I'm assuming that the super ultra low carbon vehicles are fueled with hydrogen produced onsite with steam methane reforming with the emission factor being a lifecycle number taken out of our low carbon fuel standard -- I'm sorry, taken out of our fuel cycle analysis.

In reality, though, these are electric drive vehicles that are, a portion of them are fuel cells, another portion are plug-ins, and another portion are battery electrics. But for my current purposes I wasn't able to break that down into those three subcategories, that's ongoing work.

And you can see now we're getting down pretty close. We're down to about 30, which, to me, is remarkable. We still maintain about 80 percent of the mobility, personal mobility, which was the 8200 number, is about 80 percent of the 10,3000 number. And we get down pretty close to the standard, or not the standard, but the goal.

MR. CACKETTE: And for that assumption on the steam reforming, is that like the 55 percent lower carbon footprint for that --

MR. BEMIS: That was like 65, wasn't it?

It was in that bar chart I showed earlier. Okay. This one we get there.

This one assumes all the super ultra low carbon vehicles are fueled with biomass -- hydrogen derived from biomass, excuse me. And we get down below the standard, which, to me, is remarkable.

I think though that the answer is somewhere in between these two ranges that I showed. Once I get the additional calculations done to break out the super ultra low vehicles into batteries, plug-ins and fuel cells, then I think I'll have a better assessment of this part.

But I'm encouraged that we can get there. As the grey box says, that work is still in progress and may increase -- probably will increase the emissions at least somewhat.

DR. KAMMEN: And did I understand that you're saying that all hydrogen is run by reforming?

MR. BEMIS: No. The previous slide -- in this slide, yes.

DR. KAMMEN: Okay, and then in the next one, no?

MR. BEMIS: In this slide, no.

DR. KAMMEN: Okay, my --

MR. BEMIS: This slide, it's all assumed to be biomass derived. There's a range here. In other words I'm defining a range by looking at these two options.

DR. SWEENEY: Okay, this is Jim Sweeney. For the steam reforming of producing hydrogen, I don't understand how you get as much reduction as you do. What happens to the carbon when you do the steam reforming?

If it's steam reforming and it's attributed, which I thought I heard you say, it's probably unlikely you'll get CCS out of that. You'll probably have -- because it's just too costly to capture the carbon dioxide that way. And it would then have to be released into the atmosphere.

What if you assumed about the disposition of the carbon with the steam reforming at the distributed level?

MR. BEMIS: I took these numbers from our full fuel cycle analysis report, which was done in August of 2007. And there's an appendix at the back. And in that appendix, figure A4, page A15, it specifically says that hydrogen with onsite natural gas steam reforming is 198 grams per mile. And on another chart gasoline was 431.

The numbers vary year by year. I'm giving you numbers for 2012. And so I took that ratio.

DR. SWEENEY: Okay. So that I guess would be consistent with atmospheric release of the carbon dioxide -- steam reforming. Okay, I guess I would like -- I'm surprised that you got down that far. But if you use that procedure that doesn't bother me.

MR. BEMIS: This next slide now shows new vehicle sales per year for the various vehicles that were in my analysis. And as, I think it was Mike, said earlier the light blue line shows gasoline. And the one above it in brown shows the diesel. You can see that that's a fairly small percentage of the vehicle sales in 2050. Goes down, but doesn't go away.

The green area in the middle are the ultra low carbon vehicles. And the purple are the super ultra low. And the nonrenewable alternative fuels, which are the propane and CNG, are the little red boxes above. I only used red because I wanted them to show.

Now, this shows the onroad fuel mix for these same fuels over time. And what I did was I varied the percentage of super ultra low vehicles to try to match the parameters that were in the 2050 vision, which said basically that the fuel mix in 2050 would be about 40 percent hydrogen.

So if you come down from the top you'll see it's about 44 percent actually in 2050. And the biofuels are around 30 percent, which only leaves about 25 percent left over for the gasoline and diesel and the nonrenewables, which are on the very top there.

And so I adjusted the market penetration of the super ultra lows and the biofuels to match that. And tried to match it back in 2030, which was an interim value that was in the report. And kind of close, but a little over, I think, in fuel mix shares based upon what was in the vision statement.

So this is the best I could do in adjusting and jiggling to try to make the numbers match.

And this next slide shows what the electric drive, the super ultra low vehicles would do based upon the story lines. The lower bars here, now in green, are plug-in vehicles. The orange bars are battery electrics and the fuel cells are the upper, the blue.

This shows, based upon staff analysis from the emerging fuels office, basically a quick buildup in plug-in vehicles, followed by a transition to battery electric vehicles as the batteries get better and people start buying pure battery electric rather than plug-ins in the later years.

But this represents about a 54, if I remember the number right, percent market share in the year 2050 for this group of vehicles, these super ultra low vehicles.

This shows gasoline and diesel together in one color. I couldn't stack them, because I wanted to show there's plenty of room for growth for these more carbon-intense propane and CNG vehicles. And so the fuel mix for this segment could be, what I call the low, this is my low carbon basically, could be gasoline, could be diesel, or it could be CNG and could be propane.

MS. MONAHAN: I'm sorry, can we go quickly back to the last slide on electric drive --

MR. BEMIS: Yes.

MS. MONAHAN: Because the trajectory seems a little odd for fuel cells that you would have this big buildup, which presumes infrastructure is going along with it. And then it's a dropoff.

And I'm curious, it's a little bit of a chicken-and-egg story here. Once you have the actual infrastructure for fueling hydrogen vehicles, what would be the rationale for the dropoff?

MR. BEMIS: I don't think there's a dropoff. Maybe you have the colors mixed up. The --

MS. MONAHAN: -- to do.

MR. BEMIS: The green is the plug-ins. Those do drop off. The battery electrics grow and the fuel cells grow.

MS. MONAHAN: Oh, sorry, you're actually correct. I was matching the order in the little icons to the order below. But I think I -- look at the colors --

MR. BEMIS: Oh, it's the opposite, huh? Sorry about that.

MS. MONAHAN: No, that would make a lot

more sense.

MR. BEMIS: Okay. The main point of this slide is that these are a large share of the market out in 2050, and there's a transition from plug-in to battery.

MS. MONAHAN: Yeah, so that makes perfect sense.

MR. BEMIS: And these I've got to -- this is what I haven't got done yet, was to translate this into emissions.

Okay. Again, lots of room for these nonrenewable alternative fuels.

And finally, I think this is my last graph, basically I looked at this and I did this analysis based upon emissions, not emission reductions. But other people tend to talk about it in reductions. So I created a chart to show the reductions.

And these reductions are, from the bottom working upward, are from the low carbon fuel standard; then the tire program; then working upward is the ultra low carbon vehicles; and the purpose is the super ultra low; and the dark brownish one, I guess, is from VMT reductions.

And basically this is the summation of

all the slides I showed you before. And that's all I have.

DR. SWEENEY: Jim Sweeney, again. Could you talk a little bit more about how you anticipate getting those reductions in vehicle miles traveled?

MR. BEMIS: The reductions in vehicle miles traveled could be achieved a variety of processes. In the near term it could be from mode shifting, getting people out of their cars and into buses. It could be from telecommuting. A variety of demand reduction measures.

In the longer term, and what's listed in the 2050 vision mostly is land use changes that achieve more smart growth and more dense urban form. So that we get the 8200, I think it was, vehicle miles per person.

MR. SPEAKER: Yes.

DR. SWEENEY: Good luck.

(Laughter.)

MR. BEMIS: Thank you. We'll --

DR. SWEENEY: Because VMT is probably the hardest of those to accomplish. I think that even hydrogen fuel cell vehicles and getting the, get rid of platinum catalysts and things may be easier than that really profound changes in the amount of vehicle miles traveled.

So that's one that I think is maybe, my own guess, it's most difficult to be able to accomplish.

MR. BEMIS: I think my personal opinion would be on the same lines. And I think that's why we show it last, show it at the top here.

If you recall that graph I showed way earlier where we had the business-as-usual at 10,300 and the 8200, it starts really modestly in the mid -- 2016 I think was the first year. And then it starts growing slowly from there.

So, that was what was in the 2050 vision and that's what I used. I guess I neglected to show there is a really small little contribution from the nonrenewable alternative fuels, again shown in red, between the green and the purple on this slide.

I guess there is a phone request? John Boesel from CALSTART.

MR. BOESEL: Gerry, I just had a question on I think one of your very first slides on the total emissions for transportation. It's my understanding that the 38 percent number is just tailpipe emissions, and that that did not include emissions from oil drilling and refining.

MR. BEMIS: That's correct. It also doesn't include transporting crude oil from Alaska, the Middle East and wherever else that might be produced. We import about half of our crude oil into California.

And I modeled my analysis -- now, Tom's here, maybe he can talk about this -- I modeled the approach that I used based upon what they did, my understanding of what they did, for the Pavley program where they looked at tailpipe emissions for vehicles. And for people who wanted to offer an alternative compliance mechanism, then they had to look at full fuel cycle emissions. And I think it was a jurisdictional issue. That's my guess.

MR. BOESEL: I think my point or question was if we included all those other emissions associated with our current transportation system, total number of greenhouse gas emissions would be closer to 50 percent than it is to 38 percent.

MR. BEMIS: Well, if you --

MR. CACKETTE: I think that's right; because refining, at least, and the industrial side of it is in a separate sector in the emission inventory. So the vehicle part, I think, takes care of the tailpipe emissions. And I'm not sure if it has any other emissions upstream of that.

MR. BEMIS: Yeah, then you'd have to somehow partition, I guess, the refining emissions into light duty versus medium duty and heavy duty, and the rest of it, as far as the slate of products coming out of the refinery. And I didn't do that.

And you also have the production, when some of the production's instate and some of it's not, and the refining, also.

MR. CACKETTE: Right. To the extent that this stuff is -- the product is moved by trucks, then it shows up in the truck inventory --

MR. BEMIS: Correct.

MR. CACKETTE: -- under transportation. And I think it does a little bit on ships, but only to the extent that they're operating within the state waters.

So, yeah, it's hard to do the allocation particularly. And it's good to know what the assumptions are, so --

MR. BEMIS: Yeah, I didn't include

marine. I did not include marine. I did not include upstream emissions in this 38 percent, 34 percent, 35 percent.

MR. BOESEL: Okay, thank you.

MS. MONAHAN: I have another CALCARS modeling question, but I'm not sure actually if you can answer it.

But, I'm wondering as you look at new vehicles (inaudible) reduction strategies, that the share of (inaudible) increases to about half of the petroleum-based fuels. Unless I'm reading that wrong. What you have is like 21.

MR. BEMIS: I don't have the numbers on my slides unfortunately.

MS. MONAHAN: So it's -- report --

MR. BEMIS: Oh, that one.

MS. MONAHAN: New vehicle sales -- it's slide 20, new vehicle sales per year in California. And basically you have increased penetration of, you know, super low low carbon vehicles. Then your share of vehicle increases around --

MR. BEMIS: You're saying it becomes 50 percent out in the year 2050. That's because -- the reason for that is because I'm taking the ultra low and the super ultra low out of gasoline.

MS. MONAHAN: -- share in here.

MR. BEMIS: Oh, the ultra low vehicles, I assume, were biofuel vehicles. And I assumed that they were coming out of gasoline. Now, if they were biodiesel then I could take them out of that, too.

But I took them out of the gasoline. That's why that number's like that.

MS. MONAHAN: I mean, our concern is jus that these are gasoline vehicles, from our perspective in the cheapest fuel economy of increasing debt, you can tinker with your gasoline engines and vehicles and light-weight them and do efficiency measures such that you can get the fuel economy or close to that of diesel.

And it seemed like your model instead is somehow -- diesel. So I would just suggest maybe take a share of diesel and keep it constant relative to gasoline.

MR. BEMIS: Yeah, another way of looking at that is to say, well, that biodiesel could go into the diesel vehicles also.

MS. MONAHAN: Right, what we don't want to see actually is incentive for incentives for more diesel vehicles in California. We want to see incentives maybe for very high efficiency vehicles, whatever they're fueled by.

MR. BEMIS: Um-hum. Okay, I think I get your point.

MS. MONAHAN: Okay, thank you.

MR. SMITH: Okay, we have two questions. One from Dave Modisette. Dave, are you online? Is Dave Modisette online? How about Gina.

MS. GRAY: I am online, can you hear me?

MR. BEMIS: Yes, ma'am.

MS. GRAY: All righty. The slide that you have up right now --

MR. BEMIS: That one?

MS. GRAY: Yes, thank you. And I think it goes to the same point that you were just speaking to, which is -- I'll try to get clarification for how these were all split up because basically I agree that, for example, the diesel vehicles shown on here, they could be running on biodiesel, which is the green biofuel.

So, in effect, you know, showing these as vehicles is a little bit strange because these fuels are going to be run in, you know, just like ethanol might be run in gasoline vehicles.

So I'm not too sure if this is quite reflecting what you want to reflect.

MR. BEMIS: Okay, this slide, this particular slide is a fuel slide. The previous one was vehicles. This one here is vehicles, this one's fuel.

MS. GRAY: Okay. And so in the previous one I guess --

MR. BEMIS: That one.

MS. GRAY: Yeah, --

MR. BEMIS: It's possible I could consider the biofuels going into diesel, also. Which is what the previous comment was.

MS. GRAY: And that's the green?

MR. BEMIS: Yeah. I'm worried about how much biofuels we're talking about here because we're looking at, what, 80 or 90 percent of the vehicle sales being fueled with biofuels out in the year 2050. That's a lot of biofuel. Haven't done that check.

MS. GRAY: Okay.

MR. CACKETTE: Why would that many be on biofuels, more than what --

MR. BEMIS: Well, even just looking at the -- if the purple was --

MR. WALSH: -- was biomass-derived --

MR. BEMIS: Yeah. Hydrogen. Yeah. A fraction of it would be, maybe a third. Okay. And you'd add that to the green. And maybe if you add that to the brown, that's half the fuel at least.

DR. KAMMEN: It would be worth comparing some of this analysis to what's emerging from the renewables fuel application work in Europe. They're supposed to have a series of kind of similar projection graphs available. I think they're talking October 1st, but potentially earlier.

Some of the forecasts look quite similar. They forecast like, for example, just to go to Jim's point, they forecast even larger reduction in VMT than you do. And so you can decide how real or not those are, Jim, if you want. But certainly there's some nice comparison work that's just about to be released.

MR. BEMIS: Okay, good. Yeah, I didn't create the numbers for VMT reduction, I just took them out of the 2050 vision and used them.

MS. GRAY: Can you still hear me?

MR. BEMIS: Yes.

MS. GRAY: Okay, one thing you might want to think about as all this gets developed as an alternate slide, was the move in the direction of portraying things as liquid, you know, liquid fuel, electricity, you know, gaseous fuel.

I think this is where some of the difficulty arises when people start talking about these things and not recognizing that maybe the actual diesel vehicle is going to be burning a biofuel.

And so, you know, if you could touch more in line of liquid versus non-liquid, that may help, as well.

MR. BEMIS: Okay. I hadn't thought about liquid versus non-liquid, but I had thought about breaking it down into fuel use once I get the super ultra low vehicles broken down into plug-ins versus batteries versus fuel cells, which, again, I haven't done yet. And that's why I haven't gone past this point.

MS. GRAY: Yeah, and one of the reasons I say that is at some point here the discussion is going to have to shift, and whether it's AB-118 where your funds go, or you know, broader context, is how are these fuels going to get distributed to the public, which kind of goes to Jay McKeeman's earlier comment.

And some recognition of the whole distribution system. So I think at some point we're going to have to start thinking liquid, you know, gas and electricity, those types of things.

MR. BEMIS: Okay. Also, when I first look at this slide I'm thinking, gee, we could end up with an awful lot of gasoline to export.

MS. GRAY: Um-hum.

MR. BEMIS: Anyway, that's the end of my presentation I think.

MS. HOLMES-GEN: I'm just wondering, I want to comment that it does seem in the electric drive storyline that there's a relatively low number of electric drive vehicles that you're projecting by 2020.

And I think that we should consider how we can up that.

MR. BEMIS: Okay, that question should be directed to the emerging fuels office because like I said earlier, I just used the storyline vehicle penetration numbers that they gave me and put them into my spreadsheet.

DR. KAMMEN: That's the same comment I

was actually going to base something I said later on. So, I mean, effectively, I'm in agreement.

DR. SWEENEY: And for me I'm more dubious about it. Unless we have some real battery improvement I doubt if we're going to get anywhere near that type of penetration of plug-in vehicles. So this is so uncertain because it's so driven by battery cost improvement.

MR. BEMIS: Okay.

MR. CARMICHAEL: Tim Carmichael with a quick comment. I hate to disagree with Professor Sweeney, but some of the radicals around the table in the last year have pushed a vision of 100 percent electric drive by 2020. So obviously a significant increase over what this scenario shows.

I had another quick question. Going back to the -- where's that slide -- oh, there were slides, the fuel cycle greenhouse gas emissions for light-duty vehicles. I think that was the --

MR. BEMIS: The bar chart?

MR. CARMICHAEL: The bar chart.

MR. BEMIS: Yeah.

MR. CARMICHAEL: You know, I've heard

different snippets from the Air Resources Board and CEC Staff over the last year that ARB Staff, and maybe both agencies staff, were taking another look at these numbers.

And I'm just wondering where are we in review of this. Is this the set of numbers we're going to go with for the foreseeable future, or is this under evaluation and likely to change, and when?

MR. BEMIS: I think that's a really good question. I used what I had available to me from the published report. There is ongoing work, I think, both at the Air Resources Board and I'm sure at the Energy Commission.

As far as the timing of that work and how it would fit into this, I would have to defer that to other people.

MS. MONAHAN: -- a quick follow-on, because, I mean, per our discussion it seemed as though those numbers that you have in the chart might not be accurate. It might be that there should be an increase in emissions over time in the business-as-usual case, instead of pretty much a straight line. Between 2030 and 2050. Those numbers are going to need to be revised.

MR. BEMIS: I think that if I take out that older vehicles -- back here -- maybe not --

MS. MONAHAN: But I mean still you're doubling your number of vehicles from two to four, your new vehicles, --

MR. BEMIS: Yeah, I'm going to take a look at that.

MS. MONAHAN: -- (inaudible) --

MR. BEMIS: I'm going to take a look at it. I think it's the legacy vehicles, the way I treat the older vehicles, and they should come out sooner is what I really think is happening there. But I'll have to go back and take a look.

MR. SMITH: Gerry, I'd like to get back to Tim's point. We are working closely with the Air Resources Board on updating not only the GREET model, but the output from the modeling work.

Right now there is updates under way at the Air Resources Board looking more closely at these numbers with respect to the low carbon fuel standard. And we're working with them on that.

The work that we're about to begin here at the Energy Commission is an update of the GREET model takes on a little bit longer timeframe, and a little bit longer term updates to that effort.

So, it's almost a tag-team fashion that we and the Air Resources Board are working on keeping the GREET model and the outputs current.

As Gerry said, right now, for purposes of this analysis, we have to go with what's publicly vetted and adopted, and that's what these numbers are. I think anybody looking at these could probably find any number of reasons why these are too low, too high, need to be adjusted this way or that way. Because now we have new data over the last year or two since these numbers were developed.

Andy, I don't know if you wanted to add anything to that in terms of where you folks at the Air Resources Board are in developing or updating these outputs?

MR. PANSON: Nothing too specific, but as Tom had said earlier, we're going to be adopting the low carbon fuel standard in early 2009. And though technical work to support that is going to have to be done in advance of that, so certainly just far more information is going to be coming out. And the work, at least as much as is needed to support the low carbon fuel standard, you know, will be done towards the end of this year or next year.

DR. SWEENEY: This is Jim Sweeney. Going back to this portion of new plug-in vehicle battery, responding to Tim Carmichael's point, I agree radicals are proposing a lot of things that have vision, but we can't, you know, Al Gore says no new -- no carbon whatsoever in our electricity system within ten years, but that doesn't mean because people are suggesting it that it's realistic.

What I would hope that for this analysis, if you're assuming that large amount of introduction possible for battery electric vehicles or for plug-ins, go back to what you're implicitly assuming about the battery packs that are being put in and what are the costs of those.

Are we talking about sort of 40-mile plug-ins, which I assume you may be doing some thing in that. Figure out what the cost is. Make your own judgment about what technological advances you're going to need to have in order to evaluate whether that's going to be realistic.

Because, after all, what you're doing is figuring out what technologies might be needed and how you might want to intervene in that.

So I think that's such a crucial step that you can't just jump over it as an assumption, and you got to get back to that key parameter.

MR. BEMIS: Yeah. What you're describing really is more of a description of electric drive vehicles that will be part of the storyline once that's available. I don't really know what the status is, but I believe that the vehicle range was more than 40 miles by the out years. I don't know what --

DR. SWEENEY: I was talking about the short years, like -- I think by the out years if I were going to be guessing, my own personal guess is that orange would be larger and the blue would be smaller by 2050. But I'm talking about the shorter term, the 2020, which, after all, we've got to also be paying attention to for AB-32 purposes.

MR. BEMIS: Yeah, yeah. Well, you know, this is just one scenario. And I think there's probably an infinite number of scenarios one could construct depending upon --

DR. SWEENEY: Sure.

MR. BEMIS: -- what you think might happen. But again I used the vehicle numbers that

I got from the emerging office staff and put them into my analysis.

DR. SWEENEY: That's fine. I'm just suggesting that you probably want to go back and understand the technological assumptions underlying it. Give the descriptors of the investment plan.

DR. KAMMEN: And I think in many ways this is the critical point, because no matter how much one agrees or disagrees with the rate of take-off the fuel cells and others, it really is this plug-in one that gives you any real bite on the short-term in here.

And so figuring out how the investment plan, you know, plus things like out -- X prizes and whatever else you want to invoke as the mechanisms to draw those batteries out, looking at what project better plays and all manner of other things we're doing, this is really that critical area to achieve these.

And so when the plug-in vehicle storyline is fully available, then I think there's a net set of models that everyone's going to want to clamor to do. And that feeds directly into this. I mean that's the most immediate thing on our list as of the final point.

DR. SWEENEY: Right. And that's the basic thrust of my point, not whether it's right or wrong, but how you relate to your investment planning.

MR. MIZUTANI: This is Chuck Mizutani. With respect to the sort of storylines, we took the storylines from the AB-1007 alternative fuels plan. And basically contacted the various industry people on the various alternative fuels to ask them for any updated information that they could provide.

So basically the information starts with basically about a year-and-a-half, two-year-old information and was updated by industry. We are in the process of basically providing a summary of the storyline descriptions for the alternative fuels that we looked at.

MR. BEMIS: And one last point is these are the numbers from those storylines.

Another question from online? Tom Fulks.

MS. SPEAKER: He wanted to know does the forecast include any analysis of diesel hybrid market penetration?

MR. BEMIS: The question was does the forecast include diesel hybrid market penetration. At the present time the CALCARS model does not have diesel hybrids in it. It only has gasoline hybrids.

Future versions of the model may, I'm not sure about that. But at the present time it does not.

MS. SCOTT: I was just wondering if any of your storylines regarding hydrogen are based on -- let me put it this way: Are your hydrogen storylines based on providing hydrogen fuel stations or sources to fuel up for hydrogen? Or have you considered an alternative self-propelled hydrogen hybrid?

MR. BEMIS: Again, that's a storyline question. The answer was no.

MR. OLSON: Yeah. This is Tim Olson from the Energy Commission. The storylines for hydrogen had assumptions, several different assumptions, that there would be some central station, fueling stations. Also home refueling, but none self-propelled.

MS. SCOTT: So if I have such technology should I bring that forward so we can use that as an alternative storyline?

MR. OLSON: I think we're open to comments and recommendations from anybody on this.

MS. SCOTT: Okay, good. Thank you.

MR. BEMIS: John Boesel has another question.

MR. BOESEL: Gerry, again maybe this is a question for Mike and Peter, you presented an analysis here on how we could meet the 2050 goals. And it is encouraging to see that that could be done.

You know, how -- unfold and how developed and how the marketplace does is very hard to predict. I just wonder if you could just elaborate a bit on what this modeling means for possible AB-118 --

MR. BEMIS: I think that this will be an input into the overall development of factors that will be used for weighting. Peter may be in a better position to respond to your question, John.

MR. WARD: I think this is basically the first step of the investment plan, what we're trying to do is carefully populate the 2050 vision, which will be the allocation. And that's the allocation goals that we have.

The other side that will be in the investment plan is what opportunities avail themselves to us now for funding. How those match up has not been determined yet.

And we're hoping to take this investment plan on the road and have workshops with interested stakeholders and the public to determine what those opportunities would be in the near future, mid term and long term, as well.

So that will be part of the investment plan, but that will be after we establish the allocation priorities.

MR. BEMIS: And I think you mentioned in your presentation there are other factors that we need to consider as far as training and all those other things that you mentioned.

MR. WARD: Right, the other things that I mentioned in the presentation, as well, that aren't GHG allocated.

MR. BEMIS: But important for the program.

MR. WARD: Right.

MR. BOESEL: Okay, thank you.

MR. BEMIS: Another question from the phone? Walter Seimbab, is that right?

MR. SEIMBAB: Yes, Seimbab.

MR. BEMIS: Hi, -- Seimbab -- Walter Seimbab?

MR. SEIMBAB: Yeah.

MR. BEMIS: Hi, Walter.

MR. SEIMBAB: Hi, I'm the Research Director for the South Bay Cities Council of Governments. And all of this is very impressive and exciting and really an impressive intellectual feat.

I wanted to just throw out a strategy that we're trying and make you aware of it. And if you want to work with us, that's fine.

We did some studies over the last four years of what's called the transportation performance of our urban forum. And what we discovered in all of that is that the distance of most functional destinations is -- not family things, but going shopping, going to services. Everything but journeys to work, which tend to be longer. Most functional journeys are less than three or four miles. I mean most, -- all.

And so we put that together with what technologies are on the market, and we've come up with an initiative to start introducing the electric vehicle for -- electric vehicles, they're battery electric.

And we're targeting, we have now 1.6 vehicles per household in the South Bay, and if we can reduce that, making certain assumptions about vehicle miles traveled by cars and things, if we can reduce that with targeted 1.0 or 1.1 by -- in other words you're tightening the second and third car with one of these electric vehicles, we think we can reduce the VMT generated by about 25 percent with no changes in density whatsoever.

And that's the (inaudible) -- enormous reduction. And we are in line to get seed funding to actually implement this initiative.

And I would hope something like this, two things might be reflected in your investment plan. One is encouraging others to figure out their own transportation performance (inaudible); and secondly, for innovation to come up with things like that, it would be nice if we didn't have to go around and beg for money. We got about 185,000 with the promise (inaudible) official.

But if I could get my first option to go ahead and do a very wide demonstration program, because we're trying to stimulate the marketplace.

And we think the benefits are tremendous based on what it is we want.

So, I just wanted to share that with you so that you could start thinking along those lines with respect to your program.

MR. BEMIS: That is an interesting result. I'm really pleasantly surprised that you said 25 percent of your VMT could be reduced by using neighborhood electric vehicles. I wonder how applicable that is to other areas. But if that's really true, I think that's something that should be worthy of investigating further.

MR. SEIMBAB: Right. And the MSEVs, there's a problem in that the federal government is restricting them to 25 miles an hour, when they're actually capable of going 30 miles an hour.

So one of the things we're joining is with the industry association to try and get the feds to change that, and that would make the introduction of these things even that much easier.

But, again, the calculation goes like this, is we're averaging 1.6 vehicles per household, that includes obviously one per household and that funding was back in the third car -- cars, I guess. But we're just targeting it. We're bringing it down, just getting rid of the second and third car, and have them use the electric vehicle to cut around on what trips there are, after all, for the most part, less than three miles.

So it seems an obvious application. And something we're just dying to try. So I hope by the early part of next year we'll have this funding -- the funding in place.

MR. BEMIS: Yeah. Well, I'm looking at three miles per trip, that must be an awful lot of trips in order to get that 25 percent reduction in VMT.

MR. SEIMBAB: Well, the idea is if you're driving your second car 10,000 miles, we're just looking at substituting a battery electric for that car.

MR. WALSH: But you're not talking about --

MR. SEIMBAB: -- a lot of trips. I think that's exactly right. There are an awful lot of trips.

MR. WALSH: But you're not talking about

a 25 percent reduction in VMT, are you? You're talking about a 25 percent reduction in the VMT of an internal combustion.

MR. SEIMBAB: No, we're talking about changing, reducing all the VMT associated with the second and third cars by battery electric.

MR. BEMIS: Oh, with the second and third car, or total VMT?

MR. SEIMBAB: Total VMT being reduced by eliminating the second and third gasoline-driven car in the household.

MR. BEMIS: Okay.

MR. SEIMBAB: I could go over the numbers with one of your analysts (inaudible) to do on the phone, but --

MR. BEMIS: Yeah.

MR. SEIMBAB: -- I'd be happy to do that. But bear in mind -- out is that the idea of (inaudible) centers and so forth. We looked at our (inaudible) centers and found out that a very high percentage of people are driving a quarter mile to get to that center.

And we think if we could substitute -- when you start looking at a million people driving a quarter, and a half a mile and one mile things really add up. And that's -- the assumptions around smart growth about walking, taking transit and stuff, at least in the South Bay -- don't have any facilities to how they work. People drive, period.

MR. BEMIS: Okay.

MR. WARD: Walter? I wonder if you would mind submitting your analysis to our docket. We would like to see that. And it's available on our webpage. And if you have any trouble finding that, just --

MR. SEIMBAB: No, no, no, I have -- it's one of my favorites.

(Laughter.)

MR. WARD: Oh, okay, good. That's nice to hear, as well.

MR. SEIMBAB: Yeah, --

MR. WARD: If you wouldn't mind submitting that, we'd like to take that into consideration. I appreciate your comments. And I think now we can --

MR. BEMIS: I think there's one more call waiting, one more question waiting. Tom Fulks, is Tom available?

MR. FULKS: Yes, I'm here. Thank you

for taking my phone call. I appreciate that.

I've actually got a couple questions, but I did want to add to the neighborhood electric vehicles discussion just a little bit.

We have -- my company, on behalf of, at the time, Daimler Chrysler, did a very extensive study of the owners of neighborhood electric vehicles in terms of their travel patterns and their VMT, number of trips a day and so forth. That information is on file at the Air Resources Board. It's part of the ZEV mandate information collecting process that they went through.

Bottomline is we found the people who owned these vehicles used them for three out of four trips. Of those trips that they take in their NEVs about 75 percent of them are for three miles or less. Of those three-mile-or-less-trips, two-thirds of them were for one mile or less.

What we also found was that on the average people who own these vehicles leave in their driveway two vehicles, in some cases three, internal combustion engine vehicles.

And so what we ended up calculating was a significant reduction in cold starts. I should say a significant elimination of cold starts. But we didn't find any VMT reduction at all because people were going to be taking these trips anyway.

So what we found was rather than changing their travel behavior, they changed their mode of travel from an internal combustion engine to a neighborhood electric.

So, whatever projections South Bay is making in terms of dropping VMT due to a modal shift from internal combustion engines to neighborhood electric vehicles, the data didn't bear that out in our research. But we're happy to share that, or you can go look it up over on the ARB website.

But that said, I'd like to move on to another question I had. And that is in this presentation I saw the use of the terms E-85 and flex fuel, and then the term renewable vehicle. And I just wanted to make sure I've got my definitions straight.

With regard to E-85 vehicles, I'm assuming those are being described as flex fuel. What I don't know is are light-duty diesel vehicles that use some sort of biobased fuel, are those, as well, considered flex fuel vehicles in this analysis.

MR. BEMIS: When I did the analysis, and that was a comment that was made from the people here, I assumed that they were flex fuel vehicles in replacing gasoline vehicles only.

The point was made they could be biofuel fuels and they could be biodiesels that replaced some of the diesel use in diesel vehicles.

And when I did that analysis and what you see now is based upon just penetrating into the gasoline portion of the fleet. And that's why the ratio between gasoline and diesel increases the percentage diesel.

MR. FULKS: Well, that's what I would recommend, just making the language on your presentation, so that when you say flex fuel you're saying E-85 gasoline flex fuel. Because it does make a very big difference in terms of the market mix between gasoline flex fuels and light-duty diesel as you project out into the future.

And then secondly, with regard to your author's definition of renewable diesel fuel, I'd like clarification on that. Are you lumping together all biodiesel together under one roof? And that would be the traditional fatty acid methylester or FAME biodiesel, and then the newer iteration, second generation biodiesel called renewable diesel that's made by Conoco Phillips?

MR. BEMIS: The answer from the audience was yes.

MR. FULKS: I'm sorry, was yes to what?

MR. BEMIS: It's inclusive, it's all inclusive.

MR. FULKS: So it's all lumped together, renewable diesel is all considered one category regardless of the chemistry or the science?

MR. BEMIS: Yes. People are nodding their heads yes.

MR. FULKS: Okay, thank you. Well, I would also suggest clarifying the issue because one should be replacing the other as time flies forward onto your market penetration scenarios.

MR. BEMIS: Okay.

DR. KAMMEN: I want to just highlight one thing which I think is probably obvious, but the discussion we just had about the neighborhood vehicles really does highlight the need in the modeling runs to track and to present changes in VMT, but also changes in GHG emissions, too.

I mean it's obvious, but when you have a dialogue on one you want to make sure that the results we're talking about both. Because Pavley gives us some metric on one, but not the other. We really want to think about how this impacts the overall mix.

DR. SWEENEY: One other, I guess, question. Jim Sweeney again. The words that you presented looks very very solid. I was very pleased with the quality of the thinking that went under it.

But if I understood you correctly this is developed a fairly simple spreadsheet model is calibrated off the CALCARS model, that then allowed you to do these calculations.

Is this sort of a vintage capital model where you're able to track the vintages of the various vehicles? For each one track the fuel use and then the greenhouse gas benefits. Or have you done a lot of extrapolating in between?

Because if not, I would suggest it may be worthwhile actually taking, constructing a simplified version of the CALCARS model so you can use it as a continuing tool in order to address all of the various questions that are going to continue to come up.

MR. BEMIS: I can answer your question

about what I used. This is an ExCel spreadsheet where every tab is a different model year. And there's model years going out from 2005 to 2050. And there's calculations on that tab for each year of operation for each vehicle, each model year.

So a 2040 vehicle has in it the amount of fuel it would use in 2040, 2041, 2042, et cetera, et cetera, et cetera, using that decay curve I mentioned earlier.

And then those are all summed up --

DR. SWEENEY: Okay, so you've -- capital everything in that case. I mean, yeah, okay. Well, that actually sounds like the right thing to be doing.

MR. BEMIS: It's the same tool we used in our petroleum displacement work several years ago that we did jointly with the Air Resources Board.

DR. SWEENEY: I wasn't watching that, so I don't know.

MR. BEMIS: And I just updated it to include the current forecast and I included more years and things like that. So, it's been expanded from that time.

DR. SWEENEY: Right. Good. So it looks

like a very, you know, high-quality piece of work. Congratulations.

MR. BEMIS: When I put two versions of this online at the same time the computer crashes, that's how big it is.

(Laughter.)

MR. BEMIS: I think that concludes my presentation.

MR. WARD: Next we're going to hear from Malachi Weng-Gutierrez on the medium- and heavy-duty projections.

MS. MONAHAN: Well, I was wondering before we begin is there some way you guys could give us a sense of timing for the rest of the meeting? Hello?

MR. WARD: Well, I would project that it depends, of course, on how much public comment we have at the end, but the other sections we have left are Malachi's presentation, briefly going over the schedule, and Chuck Mizutani will go over the regulatory development which is very quick, as well.

We are trying to move this along as quickly as we can and save, as I mentioned, all discussion questions for the end, clarifying as we go.

I don't know how much time that will be, 45 minutes maybe.

MR. WENG-GUTIERREZ: For me? I --

MR. WARD: No, not for you.

MR. WENG-GUTIERREZ: I only have very few slides, so --

MR. WARD: Okay. Malachi's probably 10 or 15 minutes, I'd say. And then another 10 or 15 after that. And then public discussion.

MR. WENG-GUTIERREZ: Okay. My name is Malachi Weng-Gutierrez. I work in the fuels and transportation division. And I'm going to be going over the medium- and heavy-duty emissions calculations that I did.

I followed basically a very close methodology to what Gerry used in the light-duty vehicles. I didn't have a futures model, which is kind of the spreadsheet that we used in the -- that Gerry used and augmented.

But I did modify some of the work done by the emerging fuels and technologies office to create the calculations for the emissions.

As Gerry showed in one of his early slides there was a -- the amount of GHGs attributable to medium- and heavy-duty is about 7 or 8 percent. Seven percent in 1990 and 8 percent in 2004.

VMT and vehicle stock growth throughout the entire forecast period. In the fuels and transportation division our forecasts go out to 2030. I've extended the forecasts from 2030 to 2050 using a fairly simple linear extrapolation of the last five years of the existing forecast so that it shows the same type of curve that's being observed in the forecast for the remainder of the period of time between 2030 and 2050.

In this slide I've shown the two goals, the 2020 goal and the 2050 goal. The values that are presented here are from the emissions inventory, ARB's emissions inventory. And they only include bus and transit, I believe, is what I've included here.

What I would like to do in the future in the coming weeks is include rail, as well. So that'll be something that I'll be looking to include. And so those numbers will change, the greenhouse gas goals will change because I'll be including additional sectors into the medium- and heavy-duty area.

In addition to trucks and buses, it also includes offroad emissions, or offroad consumption is what we forecast. And then the calculation for emissions is presented in this chart, as well.

The vehicle attributes in all the values that we used for the future emissions, those estimates of the attributes, as far as fuel economy, those things are obtained from the emerging fuels and technologies office.

And again, the foundation of the base forecast is from the approved 2007 Integrated Energy Policy Report, the forecasting work done in that.

So, again, this is the base number, or the base emission forecast up to 2030. And then I've extended it to 2050.

This next slide shows a shift. And Gerry talked about VMT reduction strategies. One of which would be taking people out of personal cars and putting them in public transportation.

So what we did here was we actually included that as an increased emission for medium- and heavy-duty sectors, estimating how much traffic or how much VMT would be shifted to transit, and then estimating what the footprint of the emissions would be for that shift. So that's what's included in here.

From that we've applied the other strategies that Peter had actually mentioned at the beginning of the morning, the low carbon fuel standard and then the other being fuel economy gains in this medium- and heavy-duty sector.

So, the application of the low carbon fuel standard is pretty much consistent with what Gerry used, as well. We made the assumption that the benefits would be observed here. We made no -- we didn't make any assumptions about how, if there's double counting, or how the low carbon fuel standard would actually be implemented. We just said that it would be a benefit to us and represented it as such. So we'd be meeting that 10 percent reduction in carbon content by 2020, and that's reflected in this chart.

This slide basically shows a fuel economy gain that we had assumed. We did some research about the different fuel economy gains that could penetrate the marketplace in the medium- and heavy-duty sectors, primarily looking at research that was done recently, papers and things, to make these estimates.

And we applied them on top of what our models forecast out to 2030 to see if there were some efficiencies that we hadn't captured for new technologies that might be adopted, and what that impact would be on the overall emissions for these two sectors, medium- and heavy-duty sectors. And this is the result of that calculation.

MR. CACKETTE: Can you tell us what they are, both in the basecase and what they are in this case? In other words, what is the percent fuel economy improvement per year or efficiency improvement for heavy-duty trucks?

MR. WENG-GUTIERREZ: Sure. It ramps up, I think, the base fuel economy numbers range from I would say about just under 6 miles per gallon to 11 miles per gallon, under 11 miles per gallon for all the different medium- and heavy-duty classes, from class 3 to --

MR. CACKETTE: Looking for percent per year.

MR. WENG-GUTIERREZ: Right. And then the percent per year addition on top of that, that's the base fuel economy numbers. And then the increase, it increases slowly as technologies come into the marketplace, and I think it goes from basically zero up to about, I think, 19 percent in the latter years.

So in some instances there are percentage increases of up to, I think, just over 19 percent for some sectors.

MR. CARMICHAEL: So, I just want clarification on that.

MR. WENG-GUTIERREZ: Sure.

MR. CARMICHAEL: So up to a 19 percent improvement by 2050 in some --

MR. WENG-GUTIERREZ: Yes.

MR. CARMICHAEL: -- applications?

MR. WENG-GUTIERREZ: In some applications.

MR. CARMICHAEL: Thank you.

MR. CACKETTE: But you don't have a number that's just for the fleet, what it is, per year or what the range is?

MR. WENG-GUTIERREZ: We have it broken out by classes. So I mean I could average the numbers. It's just above 19 percent is what I would say. But if you'd like a matrix of the numbers, I can certainly provide that to you.

It's just ramping up in a logistic curve from early on in the forecast period to about, you know, under 19 percent, or 19 percent in 2050.

MR. CARMICHAEL: Across the fleet?

MR. WENG-GUTIERREZ: Yes. I believe it's across the fleet.

And, again, if there are more reasonable values that you would suggest we'd be happy to review those or investigate any further technologies that you'd like to be included in this fuel economy gain estimate.

And that gets me to almost my final slide. It's very quick. This is basically information that was provided to me from the emerging fuels technologies office, again. Different technologies.

I've included the CNG, LNG, biodiesel or biomass-derived diesel, -- diesel -- hydrogen in this to see whether or not, what magnitude of reduction could be attained by including those.

And if you notice here, the emissions here in 2050 is about 46.7 million metric tons. In here it's about 44.4, so there's very little reduction in transitioning over to these fuels that I calculated.

Now, again, these are very preliminary calculations and I need to look at them. There definitely is a shift in what is being used as a fuel so that here you see the purple diesel emissions is fairly large. And then if you introduce the alternative fuels there's still the -- travel's still occurring, VMT is still increasing and so you do have a larger magnitude of other transportation fuels being introduced. But then they become a larger emission footprint.

So, there's still a big gap that needs to be filled, which I'm assuming TIAX will be discussing for the medium and heavy duty, as well as other technologies that will need to be included in the next couple of weeks.

One of the technologies that certainly I didn't include was the electric drive technologies. And that may actually lead to some reduction, as well.

Yes.

MR. CARMICHAEL: Tim Carmichael, again. Just eyeballing it, we're talking about roughly a 30 percent penetration of nondiesel fuels? Is that what that shows?

MR. WENG-GUTIERREZ: Eyeballing it, yes.

MR. CARMICHAEL: Thank you.

MR. WENG-GUTIERREZ: And then it gets --

this is my last slide. Again, I was trying to look at the reduction amounts that were provided for each of the different reduction strategies or technologies of fuels that were actually provided to me from the emerging fuels and technologies office.

And this is just a slide that shows the magnitude of those reductions over the forecast period. So, again, biomass derived diesel, you know, is the blue. Light green is the CNG. And, again, these are displacing diesel, traditional diesel, but they still have an emission footprint in and of themselves, which is added to the previous slides emission values.

And that is pretty much my set of slides. If you had any questions on those I'd be happy to answer them.

MS. MONAHAN: This is Patty Monahan from UCS. I'm curious, your rate of CNG penetration in the heavy-duty world is high. And I'm wondering, can you talk a bit more about how that -- where that forecast is coming from, the 2050?

MR. WENG-GUTIERREZ: Well, yeah, and I guess it looks high here, but really it's not that -- well, the forecast, the assumptions and everything that I'm using in these calculations come from the emerging fuels and technologies office.

And I believe those then primarily were arrived at through conversations with the industry, as well as researching whitepapers and items like that. I'm not sure of the specifics as to how the analysts came up with all the estimates, but I know that it has been vetted through industry, stakeholders.

MS. MONAHAN: It is interesting because it seems like you're getting past the old hydrogen technologies and I'm not clear -- and maybe I'm just not understanding why CNG would be so superior to hydrogen over the long run. I see in the short run why it would be.

MR. WENG-GUTIERREZ: Yeah. And I think those nuances are things that we still need to look at. I understand the question exactly; when you have a gaseous fuel, you know, why would you -- wouldn't you see a shift towards hydrogen and away from CNG in the long term as the infrastructure becomes available.

So I think those are things that we'll have to look at in the coming weeks.

Okay, I think there are two -- I'm sorry, go ahead.

MS. MONAHAN: No -- thank you.

MR. WENG-GUTIERREZ: Okay. John Boesel.

MR. BOESEL: John Boesel with CalStart. We've done a lot of work with hybrid trucks and see that market segment really taking off. I wasn't quite sure where that got factored in (inaudible) las slide.

MR. WENG-GUTIERREZ: Yeah. Actually the hybrid trucks have not been included in this calculation yet. Again, there was a plug-in hybrid electric, electric and the hybrid trucks were not included in this segment of the calculations yet.

There is some questions about the electricity footprint and what we were going to be using for some of those values. And so we're still working out those specific emissions. That should be included, though, in the next couple weeks.

MR. BOESEL: Okay, thank you.

MR. WENG-GUTIERREZ: Um-hum. And then, Tom Fulks, was there a question?

MR. FULKS: Yeah, following up on what

John Boesel just asked, I'd also like to ask you to include hydraulic hybrids in your future analysis. Right now I'm speaking on behalf of the Diesel Technology Forum, which is one of the trade associations that represent the diesel, heavy-duty diesel industry as well as light duty.

In terms of your scenarios with regard to CNG market penetration, I'm not exactly clear what industry stakeholders you run this one past, but I'm sure if you run it past the CNG and LNG stakeholders they would agree with it. I'm not too sure that the diesel stakeholders would. But that's not necessarily the main point.

What I would like to suggest is that you go back and add a category for what we anticipate to be the future growth of heavy duty in terms of power-train technology. That would include electric hybrid, non plug-in. And hydraulic hybrid. Because that's really where we see the growth happening in terms of powertrain development.

To some degree way out in the future there's going to be hydrogen, but right now in terms of just the torque necessary to haul heavy loads, that is where the industry is leading. So, for credibility of your slide I really encourage you to do that.

Secondly, I think with regard to greenhouse gas emissions reduced, could you tell me in addition to CO2 what other greenhouse gases have been included in the calculation?

MR. WENG-GUTIERREZ: N2O and methane were included, I think, in Gerry's and mine, both sets.

MR. FULKS: So, yeah. Zeroing in on methane, and I'm not exactly clear how you can get an increase of CNG at this level without a commensurate increase in methane output. And so especially right now unregulated, unfiltered methane venting of fuel tanks on the LNG vehicles, particularly, I'm just wondering if you got that right.

MR. WENG-GUTIERREZ: Well, those estimates were, I think, captured from the emission inventory. There was some ratio-ing done that Gerry had provided to me. So, I'm not sure if whether or not it specifically captures that.

But I know that the CNG footprint here does capture the methane associated with that sector. I mean I can certainly take a look at the specific calculations for that, and whether or not it's being included.

MR. FULKS: Okay, thank you.

MR. CACKETTE: And similarly on the LNG, is that a lot of LNG with a tiny benefit, or is it a little bit of LNG with a big benefit? Is that my understanding, it's LNG -- benefit?

MR. WENG-GUTIERREZ: As I recall the calculation, I think it's pretty -- there are similar amounts of both CNG and LNG are penetrating the market. It's almost 50/50. I think it varies, but --

MR. CACKETTE: How much overall compared to diesel?

MR. WENG-GUTIERREZ: Well, again, it would be the segment that here is in light blue, include both LNG, CNG, as well as the hydrogen and others. So the --

(Parties speaking simultaneously.)

MR. WENG-GUTIERREZ: Yeah, I'd have to look at the calculation. I can pull that up for you and get that to you.

DR. SWEENEY: Jim Sweeney. I've got a question. I haven't heard any discussion whatsoever in either of these two presentations about what your beliefs will be about the prices of the various fuels on the marketplace. And -- right here where we have CNG replacing diesel.

So could you talk about what you're assuming is the price structure over time of natural gas versus the petroleum? And the reason why I ask, of course, is that I believe that over time that particularly with the pressure towards reducing carbon dioxide emissions, we're going to probably going to be using natural gas pretty intensively for electricity generation.

We're going to, as much as possible, move away from coal. We may be able to -- we'll get some biomass and significant quantities of natural gas, of the fossil fuels is the lowest carbon dioxide.

So I think that that's going to be a little pressure on that for electricity generation. And I would expect very really high prices of natural gas perhaps converging, the same converge roughly to a fuel equivalent to diesel or a petroleum-based fuel.

In that case I'm not sure whether, how the market structure supports this movement towards -- amount of CNG. So my real question is what have you really assumed about the prices of natural gas versus diesel over this long period.

MR. WENG-GUTIERREZ: So, the price assumption with natural gas is not included in our calculations at all. We do have a price forecast for other transportation fuels in our transportation fuel demand forecast, as in the IEPR, does include forecasts of those transportation fuel prices.

But CNG in this calculation, the price of that item is not included.

DR. SWEENEY: How can you even begin to estimate market penetration of CNG without thinking about the cost of it relative to diesel?

MR. WENG-GUTIERREZ: Well, it may not be included in our calculations, but it is certainly considered, I think, in the market penetration. And I think, you know, the emerging fuels and technologies office can speak to that.

MR. OLSON: Mr. Sweeney, this is Tim Olson at the Energy Commission. Yes, we did make assumptions on the prices of all the different fuels in these in the storyline scenarios that made projections from 2008 through 2050.

And, of course, the further you get out

in time you get lots of questions about how you can predict all this pricing.

DR. SWEENEY: Oh, of course, yes.

MR. OLSON: And to get your frame of reference, when we did that analysis around August 2007 we were using a gasoline, the Energy Commission's projection, the high price projection and 20 percent high and low.

And fuel prices at that time were about 3.15, 3.20 a gallon of gasoline. And we assumed, based on information we gathered from fleet contracts and then estimates done on projected natural gas electricity rates in the future by our electricity office here at the Energy Commission.

We did two different things, fleet pricing and also retail pricing. Fleet pricing for natural gas was averaging about $1.50 a gallon. Today it's about $2 a gallon gasoline equivalent.

And we did a projection that basically assumed there would be a price increase over time, a steady price increase over time. But still cheaper than gasoline and diesel over time.

So, that's embedded into the storyline analysis. It's one of the key assumptions.

DR. SWEENEY: Okay.

MR. OLSON: And that actually --

DR. SWEENEY: -- I'd have to look more precisely at that, but I agree with your point. You really don't know, but it does sound like you at least would take into account natural gas prices should be going out significantly over time.

MR. OLSON: Also, to your point on what does this mean in terms of if natural gas is a significant contributor or part of the market, and either light duty or heavy duty.

If you remember the discussion we had earlier was we used the moderate case scenario projections based on a lot of input over a year and a half of information gathering.

And we asked our electricity office here that does all this kind of big-picture analysis, if we could achieve these natural gas scenarios, as Malachi described here in the medium duty, heavy duty, what would that mean for the overall picture of California use of natural gas, whether it's for transportation or electric power generation.

And they did their analysis of the

moderate case, and then a real aggressive growth case. And in the most aggressive case it's 6 percent of the total transportation -- of the total natural gas use in California, 6 percent would be devoted for transportation natural gas in the most aggressive case; it's about 4 percent for the moderate.

MR. WENG-GUTIERREZ: Light duty, medium duty and heavy duty combined?

MR. OLSON: It's combined. Light duty, heavy duty, offroad, onroad.

DR. SWEENEY: Right. That wasn't the issue. Natural gas pricing will be essentially set on a national market based upon supply and demand for natural gas, basically dominated by electricity supply. And so that wasn't that there's room for it, it's just whether the economics hold that support this sort of market share, given the natural gas prices that apt to set on this national market.

That was the nature of the question.

MR. WENG-GUTIERREZ: Okay.

MS. HOLMES-GEN: What is the E-diesel? I thought I knew what it was, but now I'm not so sure.

MR. WENG-GUTIERREZ: What's that E-diesel include?

MS. SPEAKER: Diesel and like (inaudible).

MS. HOLMES-GEN: Okay.

MR. WENG-GUTIERREZ: Okay. The answer to that was that it's diesel blended with 7 percent ethanol, I guess, by volume.

And then we have two more questions. Walter Seimbab.

MR. SEIMBAB: Yes, this is I don't think nearly as profound as what you were talking about, but I noticed in the slide you went by kind of quickly about the mode shift expected to -- from cars to public transit. And I don't know how significant it all is.

But at least from the South Bay's perspective, again I wanted to raise our concern about any mode shift to public transit making up any kind of substantial -- we have two kind of concerns about it. One is transit scalable, and then the other is just is it expandable.

And by scalable, we mean that when the Pacific Electric was really really successful and in the County there were less than a million people. And almost everybody was going downtown.

Today we have 10 million people and they're going to seemingly 10 million different destinations. So I'm not sure that public transit is really going to be up to the job.

Second is transit service is kind of universally lousy, certainly in the South Bay. And substandard in a lot of places around L.A. County. And the (inaudible) and the labor and the maintenance and the maintenance yards and all that could really be acquired in a timely fashion and affordably to accommodate these kind of projections.

But certainly ARB was making about the role of transit -- in the future. And in regards to that, I'd like to urge ARB, I guess they're there, to kind of work towards what sort of mode split would be required in each region, and what level of service to produce that mode split, and what level of investment would produce that level of service.

Because I think we remain pretty skeptical that public transit is going to play much of a role.

MR. WENG-GUTIERREZ: Okay, those are

good comments. I think we did certainly take a look at what elements of public transportation would be affected. Would there be an increase in load factor with more people riding the buses. Or would there be actual new buses on the roads.

And so those were definitely things we considered. These are, of course, preliminary. So if there were some other estimates as far as mode shift and the level of service that would be assumed by ARB, we'd love to have those to consider as well.

Is there a second question? Dave Modisette.

MR. MODISETTE: Yes, thank you. I just wanted to clarify. Early on in your presentation you said you had included the offroad or what I might call the nonroad vehicles and technologies.

But then later on you said you had them included in the electric technologies. So I guess I just wanted to clarify that your current analysis does not include things like truckstop electrification and electric truck refrigeration units in any electric industrial vehicles like cargo handling equipment and things like that.

Is that correct? And will those things

be included in some future version of the analysis?

MR. WENG-GUTIERREZ: That is correct. And we will definitely look at including those in the next few weeks into this analysis. So, yeah, it does not include any of those, the electric stuff, truckstop electrification or anything like that. Those are not included.

MR. MODISETTE: Okay, thank you. And what about things like marine port electrification and future high-speed rail?

MR. WENG-GUTIERREZ: Right. And I briefly went over this at the beginning, I guess. What is included in these numbers, is only trucks, buses and offroad consumption. So we didn't really look at rail, marine, aviation, anything like that. But we will be looking at some of those sectors at least in the coming weeks and trying to include them in our estimates.

MR. MODISETTE: Thank you.

MR. WENG-GUTIERREZ: And I guess just for clarification purposes, on this slide where it says P/C shift, that means personal car. It's a shift from personal cars to public transportation.

Are there any other questions? If not

then I'm going to go ahead and hand this back over to Peter.

MR. WARD: Thank you, Malachi. At this point I think maybe we should check in with everybody to see how we're hanging. Does anybody vote for taking a lunch break, or to plow through.

I think Tom's already voted.

(Laughter.)

MR. WARD: Anybody else? Vote to plow through? Plow through, okay.

Next up, and I didn't mention this earlier, but it is on our agenda, that Mike Jackson of TIAX will walk us through the gap analysis that they performed for us. He's, I think, already on the phone. Mike?

MR. JACKSON: Can you hear me?

MR. WARD: There you are. Okay, Mike.

MR. JACKSON: I guess I needed to be unmuted.

MR. WARD: Yeah. Good afternoon, Mike. Thanks for hanging in with us.

MR. JACKSON: Not a problem.

MR. WARD: This is Mike Jackson from TIAX telling us about the gap analysis they performed for us.

MR. JACKSON: Okay. This is a -- can everybody hear me there okay? Peter, can you help make sure everybody can hear me?

MR. WARD: I think we can hear you.

MR. JACKSON: All right. What I wanted to do today is walk through at least the status of the work that we performed to date on understanding what -- taking sort of a snapshot of the amount of investments being made in conventional, as well as new, as -- in the transportation sector. We will turn to technologies in the presentation.

And then let's go to the second slide, Peter, please, or whoever's doing the slides.

MS. MAGANA: Mike, you should be able to control it now.

MR. JACKSON: I can?

MS. MAGANA: Yeah. You're able to?

MR. JACKSON: So I can just do a page-down or something?

MS. MAGANA: Yeah.

(Pause.)

MR. SMITH: Pilar, in the interest of time, just do it manually --

MS. MAGANA: Yeah.

MR. SMITH: Thanks.

MR. JACKSON: I think it's on here now, so okay. Let me just go quickly over what our project objectives were here. And the objective of what we were trying to do to identify funding that was already committed, or at least spent on development and commercialization of cleaner, more efficient technologies.

The methodology was one form of quick literature review and construct sort of a table/ matrix of funding being committed or supplied for each of the alternative fuel or advance technologies.

And that included vehicle efficiency, conventional hybrid was put in our vehicle efficiency. Biofuels, natural gas and propane, and electric drive technologies which would include not only battery electric, but plug-ins as well as hydrogen fuel cells.

And we wanted to kind of categorize the extent it was being done in terms of R&D, demonstration and deployment, infrastructure. And used here infrastructure is fairly broad in terms of including both fuel production and storage, distribution and dispensing. And then finally looking at the sort of incentives deployed.

Secondly, once we had done that review, we also wanted to talk with key government and industry stakeholders and experts to confirm the funding information that we had collected; and make sure we had an update of what their programs were. And then finally to get a perspective on barriers and needs that they saw in terms of directing those programs.

And then finally we tried to seek some information from the various stakeholders that we did contact of how, you know, from their perspective how one could best leverage 118 conventionally.

So that was the goal of what our study was. As Peter has shown, -- can we go to the next slide.

MR. WALSH: Michael, this is Mike Walsh.

MR. JACKSON: Yes.

MR. WALSH: Did you limit yourself just to the U.S.?

MR. JACKSON: No, as you'll see here, Mike, this also is on the -- there's three categories of funding that we were looking at. Federal, which is obviously U.S. State, which is obviously U.S, but private was more global in nature. So we tried to look at all three of those sectors and I'll show you some results of how those have come out so far, at least in our analysis.

MR. WALSH: Thank you.

MR. JACKSON: On the second slide here, as Peter has shown earlier, this slide is showing the various fuels on the left-hand side of the table. And the various milestone years, 2012, 2017, --

MR. WARD: Mike, can you hold a second. We're trying to get that slide up for everybody here.

MR. JACKSON: Okay.

(Pause.)

MR. WARD: There we go.

MR. JACKSON: Is it up?

MR. WARD: Yes.

MR. JACKSON: Okay, so again left-hand side we're showing the various alternatives, primarily alternative fuels in this case. And the various milestone years. This came out of the basically California alternative fuels plan, which was adopted December 5, 2007.

This chart here was also in Peter Ward's investment plan, table 1 of his investment plan that was presented at the, I think it was the July 9th meeting of the advisory committee.

And there's two things to know. One is the amount of fuel that's being used; and two, how much of GHG or greenhouse gas emissions are avoided. These are -- millions of metric tons.

And again, this is in the -- these are similar to -- these are just sort of snapshots or slices similar to what Gerry Bemis and Malachi just presented -- and put everything back together again in terms of (inaudible).

But you can see that there are a couple of alternative fuels like the XTLs, for example, that have a considerable amount of fuel displacement, petroleum fuel displacement, but may not necessarily have similar benefit relative to avoiding GHG emissions.

And also highlighted here is the E-10 midwest corn-to-ethanol, which apparently is undergoing some debate relative to the indirect emissions impact.

The point on this chart is just to put things again in perspective. I think you guys have seen enough of that already this morning. But some of these fuels and technologies are going to have a bigger impact role in the GHG reduction; and some will have a bigger impact relative to fuel displacement.

Next slide, please. Now I want to just go through and give you guys some of the preliminary results that we've put together for this presentation looking at where the funding has gone.

Peter, are you able to go to the next slide.

MR. WARD: You're up, Mike.

MR. JACKSON: It's not up on mine. Okay. It's not showing on the webcast.

(Pause.)

MR. MARGOLIS: I apologize, Mike. On your computer you're seen according to what you control, but everyone else does see the correct slide.

MR. JACKSON: Okay, so I don't need to worry about what I'm seeing then. This slide number 3 is -- what we're looking at here is the federal funding. And this is the 2009 estimates. Caveats on this, this spending has not yet been approved, but it is very similar to what's being asked or requested through the various agencies that have requested this.

This funding includes not only DOE, but included U.S. Department of Agriculture, as well as other, DOT, et cetera. And we've broken the funding down, as I said before, to R&D, to demonstration, to infrastructure and incentives.

And the categories that are shown on this, this is federal investment in millions of dollars, though we're talking about an order of magnitude here, millions of dollars.

Electric drive on the X axis; electric drive, hydrogen and fuel cells, vehicle efficiency, biofuels and natural gas and propane.

And let me kind of go from the sort of top down here, the incentives. You can see that the categories to the right-hand side of this chart, natural gas and propane, biofuels and vehicle efficiency all are dominated by the incentives that are in place. For natural gas and propane and biofuels that incentive is roughly 50 cents a gallon, either in the blender's tax credit for the biofuels, or the 50 cents per gallon incentive that's in place for natural gas and propane.

The vehicle efficiency incentive has to do with the tax credits that are available for buying those vehicles, albeit some models like the Prius are dwindling now, but still some of the tax credits are available.

And you can see that the electric drive and the hydrogen are primarily focused on the R&D side, although there is the demo that's been in place for several years now on the hydrogen side of things.

What dominates here, of course, is the biofuels. And the biofuels dominate because they're is so much of that fuel being introduced now. And we're talking on the order of 7 to 8 million gallons of fuel; and you multiply that by (inaudible) tax credit. And you can see that there's quite a bit of money that is going to the biofuels.

Next slide, please. Can everybody see the slide?

MR. WARD: Not yet, Mike.

MR. JACKSON: Okay.

MR. WARD: There we go.

MR. JACKSON: All right. So let me take

out the incentives and just kind of show the pictures, so now I've taken off the large chunks of incentives put there, just to look at what's being invested relative to research and development, demo and infrastructure.

Then again you can see that on the electric drive and the hydrogen fuel cells, and to a certain extent on the vehicle efficiency, dominated by research -- what I would call research and development money being spent. With the hydrogen fuel cells being roughly two to three times more than the electric drive or vehicle efficiency.

On the biofuel side there is a lot of money being spent mostly on going from what we call, or what's been called gen-1 biofuels -- to ethanol, to more of the cellulosic which would be the gen-2 biofuels. So there's a lot of money within the demonstration part of that.

Infrastructure again tends to be fairly -- it's not very much at all being spent. And you'll notice here that natural gas and propane have pretty much zeroed out. There's very little being spent at the federal level on this.

Next slide, please.

MR. WARD: You're up.

MR. JACKSON: Sometimes mine works and sometimes it doesn't. Okay.

This next slide now shows where we are relative to looking at some of the state funding. And this is all 50 states. This estimate was done mostly on looking at the types of programs that the various states have in place. And then trying to factor those programs based on some estimates we did of what's happening in California, the type of money.

So, it's not as firm as the federal, which we could look at actual numbers that are given for each kind of category of R&D. But also give you an estimate of what's happened.

And, again, you can see that the biofuels tend to dominate here, mostly due to incentives that are in place. The electric drive hydrogen vehicle efficiency and natural gas are sort of all on the same order of magnitude.

MS. MONAHAN: Mike, this is Patty; this is just state funding --

MR. JACKSON: Those are the 50 states. Not California only. And that's -- on our part to indicate how much money is being spent by the individual states.

MS. MONAHAN: Okay, thank you.

MR. WARD: Separate from federal dollars, right?

MR. JACKSON: Separate from federal dollars. And obviously the order of magnitude here is much less than federal dollars, not surprisingly.

Now, it does indicate a little bit, this is sort of a trend with state funding, is that there's more -- there tends to be a little bit more emphasis on the incentive -- well, I guess -- never mind that comment.

Let's go to the next slide.

MR. WARD: Okay.

MR. JACKSON: All right. If you look at the private sector and Mike Walsh's comment is pertinent here, this is now looking at trying to estimate on a global basis what's being invested in these various fuels.

And on an aggregate basis we can do a pretty good job of getting the numbers right. When we try to disaggregate it, that's a little bit of our science that we've done in terms of putting it into these categories. But we believe that we have a pretty good methodology for that, and be happy to share that with you when we put this report together.

Again, what you see here is a substantial amount of money that is going into the biofuels commercialization. And not surprising, there's a lot of plants that are being built around the globe to produce these fuels.

Whereas the electric drive, hydrogen and fuel cells and vehicle efficiency are still pretty much in the R&D phase. There's a lot of money being put in the electric drive battery elements compared to the hydrogen fuel cells on the private side. But fairly comparable in terms of dollars in terms of order of magnitude.

And I would have to say that our estimates on natural gas and propane are less than probably accurate than any of the other numbers here in the sense that we had to go to various annual reports and try to make an estimate of what's happening on the global side.

MR. SHEARS: Yeah, Mike, this is John Shears. I'm just curious, given the -- especially when we're talking about vehicle technologies, really, you know, with multinational OEM, (inaudible) also be useful just on background, at least, to develop estimates for funding (inaudible) possibly even China? That may not be, but I think that might be helpful, at least not only for this work, but other work (inaudible) going forward?

MR. JACKSON: John, my comment in terms of fidelity of this data is, you know, for what we got that would be very very difficult. We'd have to do additional research to make that happen. But I understand.

MR. SHEARS: Okay, thanks.

MR. JACKSON: Again, the takeaway here is there's considerable amount of money being put into biofuels and the other technologies have considerable sums being put into them, and sort of matches what's happening at the federal level.

Next slide, please. So based on, you know, sort of our takeaways here, again I said this, the biofuels are dominating the investment landscape in both public and private context. And most of this is coming out of the tax credit and the capital investment that is focusing on the gen-1 biofuels. But there's significant private and public sector R&D directed towards the gen-2 biofuels.

The investment in the high efficiency vehicles focuses on rolling out mostly the current platforms that are coming out on the hybrids and the clean diesel -- the various manufacturers.

But technologies that focused on say some of those road-load reductions such as light-weighting and aerodynamic improvements. And those that focus on the heavy-duty vehicles are less heavily funded. Not surprising on the heavy-duty side; a lot of focus has been put on meeting the more stringent emissions standards for 2010 -- for 07 and 2010. And less effort has been put on improving the efficiencies of those vehicles (inaudible). But even on the federal level, less of these than others.

Battery technology, not surprising, is a huge area of research right now at both corporate and VC level. Public investments in the electric drive technologies, however, have to say, lags significantly behind the private sector.

And here, again, our data development isn't all that good, isn't as robust as I'd like it to be, because it's hard, sometimes, to tell, you know, where the investment being made here.

Is that for portable battery equipment or is that for vehicle battery. It's hard to break that out.

Hydrogen fuel cell funding is primarily done at the federal level, although you did see some amount being done by the private. But it's mostly focused on near-term nontransportation application such as portable power.

And judging by the ratio, if you take some of these ratios, the public/private investment, the electric drive vehicles appear to offer one of the highest leverage for getting investment into new vehicle technology.

Now, let me give you a couple snapshots of what people that we've talked to had to say. Next slide, please.

MR. SMITH: Hey, Mike?

MR. JACKSON: Yes.

MR. SMITH: This is Mike Smith. Can I ask you a question before you go to the next slide.

MR. JACKSON: Sure.

MR. SMITH: Can you go back to the slide? Middle of the slide, regarding battery technology, you make the comment that public sector investment lags behind private sector.

I guess my question is is there a need, given the private sector investment, is there a need for public sector investment?

MR. JACKSON: Well, this is -- that comment has a lot to do with the fact that some of this is going -- some of this research is going into non-vehicle applications. So my basic feeling is yes, there needs to be a substantial amount of effort on public funding to get, to roll these vehicles out, get them into the infrastructure now.

That said, of course, there's always the fact that there is some driver for that already in the ZEV regulations. But we have yet to get that technology out there in the marketplace, seeing how it's really going to work, and whether it will work.

MR. SMITH: I guess my confusion comes from maybe it's just the way the sentence is constructed. It seemed to focus on battery technology, but then in the latter -- as I read it more carefully, the latter part of the sentence talks about -- you're talking about general investment in electric drive vehicles.

MR. JACKSON: Yes.

MR. SMITH: Okay, all right. I guess I was more focused on the need for public research of a battery technology. Okay, thank you.

MR. JACKSON: And I'm not sure I know how to answer that one, either. There's considerable amounts being done on the battery side, but as Professor Sweeney pointed out, there needs to be a tremendous amount in terms of reducing the cost of the battery.

DR. SWEENEY: By the way, note that both presidential candidates have made a very specific part of their plans significant incentives for battery development. So I think whoever's elected president, the federal government is going to shift some of their priorities in that direction, if you can believe what the two candidates say.

MR. CARMICHAEL: This is Tim Carmichael. Mike, I've got a quick question, actually a comment and a quick question.

The comment is with the exception of biofuels, these numbers all look shockingly low to me. And it's not something I've tracked or looked at before, but I'm curious. You spend more time looking at this, and maybe Mike Walsh does, as well. It just seems like on a global scale these numbers are really low, you know, for me, emphasizing the importance of the program that we're talking about.

DR. SWEENEY: Welcome to federal R&D in energy.

(Laughter.)

MR. JACKSON: I can make one comment on that, Tim. And that is -- well, I can make more than one --

(Laughter.)

MR. JACKSON: One comment is if you look at what Congress has authorized for some of this research, it is considerably less than what it actually approved for funding.

So Congress' wish list, so to speak, in terms of what should be spent, is much much higher than that shown on what actually gets appropriated.

MR. CARMICHAEL: Okay, thanks for that additional detail.

The other question I had is how much does this vehicle efficiency bar capture of what the industry is investing in regular gasoline vehicles? You know, there's obviously R&D, demo, and commercialization going on for gasoline vehicles today. And I'm just curious, is that the best you could capture it in this vehicle efficiency? Or is there really another big bar that dwarfs these?

MR. JACKSON: No. We think that it captures what the industry is actually spending to meet its goals. You know, this is a slice in time, Tim, as of today. They may have to increase that considerably for meeting CAFE, for instance.

MR. CARMICHAEL: Okay.

MR. WALSH: This is Mike Walsh, Mike. Is this per year?

MR. JACKSON: This is a slice -- yes, this is a slice of 2009.

MR. WALSH: I would just say I would expect, and I don't know how you would get these numbers, but if one were able to get the kind of numbers that are being spent both publicly and privately in places like China and Europe, I presume you've gotten some of the Japanese. But I would think they would increase these numbers significantly. I don't know how you'd get those numbers.

MR. JACKSON: Well, as I said, the numbers that we got, I think we have a fairly good feeling for the aggregate numbers which should include both China and Europe being spent. The fidelity issue to me is kind of like a disaggregate.

We can go over in some detail how we developed those numbers, but the report, you guys could take a look at it. Appreciate any comments you have on that.

Any other questions?

Okay, moving to just a indication of the people we contacted in the short two weeks that we had to do this effort are shown on this page. Again, we sort of focused on those that were in the DOE program because the budgets were fairly well known, plus it gave an indication on what they put in their programs they were working on.

I can move to the next slide, kind of summarize some of the input we got from these various stakeholders.

In general, the stakeholders basically, and not surprisingly, identified, you know, we really got to work through the transition period going from, you know, research and development to getting it into the marketplace.

And that, one of those keys, especially

for alternative fuels is making sure that you match the vehicle to the fuel and infrastructure or vice versa. If you're going to fund the demonstrations, provide tax incentives, streamline permitting and create, maybe create what's known as an early mover advantage to those OEM, or those manufacturers that want to get in the market early. It will all help in terms of moving that transition.

I think another thing that was stressed throughout, people we contacted, was the fact that there are no silver bullets. I think we all know this now. That it's important to fund multiple technologies, to hedge bets, and recognize technologies aren't mutually exclusive.

And really, you've got to be able to increase the size of the funding pie. And for that we'll need a major commitment. Some suggested funding multi-fuel stations or to help the infrastructure issue.

And others suggested funding should be spent in relation to the viability, environmental performance and potential to meet the total demand reduction goals is something that the Commission, of course, was highly focused on that.

Again, this comment mostly comes only from the ZEVs, but I think you can see that there's quite a bit of work being done on the R&D side, but there's not as much work on these advanced vehicles being done on getting them into the commercial space. So focus on incentives rather than R&D for most technologies.

And then finally, of course, if you're going to do that, then it's important to collaborate with the people that are bringing the technology out of the R&D space. So, collaborate with national partnerships, OEMs and the federal government on the planning, testing, codes and standards and vehicle and infrastructure demonstrations.

Now let me give you some highlights relative to each of the technologies that we got from various stakeholders. Stakeholders also identified actions for each of these advanced transportation technology.

So, electric drive. One, support domestic battery production. That was a big issue that came out. The issue here is, now I think we have to be a little bit careful of this in the context of the world economy, but the issue is if we're supporting oil, why should we be then changed to expert supporting batteries.

I think probably a better argument would be jobs. And with California, in particular, U.S. possible.

Also I think there is need to evaluate some of the grid impacts and benefits. There's been a lot of studies that have looked at this, but we have yet to have a plug-in hybrid in the neighborhood and how that whole effect, not only the distribution but is there enough power supply to handle that. And how the smart grid can make that all work.

Cooperate with industry on testing and codes and standards obviously is important. Making sure that these systems are designed and will work under all circumstances.

Demonstrate the vehicles and the infrastructure. What will happen with a smart metering, will people actually off-peak charge plug-in hybrids.

Work with the utilities and the OEMs to figure out the value proposition for deployment in the next two to three years. That means, you know, the batteries are a major chunk of the investment. Is it best for the vehicle owner to own that battery. Or is there other ways of handling that cost.

Hydrogen and fuel cells. Number one thing on everybody's mind is infrastructure. There's roll-out of vehicles happening today. We need infrastructure in order to support those. And it's got to be infrastructure that is convenient to the user. And these are going to be a losing proposition. Industry is not going to invest in these stations. But if you're going to actually see whether this makes any sense, the public is going to have to make that investment.

There was also some comments about overcoming some of the negative public perception.

On vehicle efficiency, comments were focused a little bit on the heavy-duty side. And it would help to demonstrate some of those light-weighting issues, or research that's happening. And some of the carbon fiber that is used in the light-weighting concept, some of the recycling and reuse issues that come up.

Next slide, please.

Two more. Biofuels. The suggestion was that there needs to be a definitive study on sustainability because there's been quite a bit of talk on the indirect effects of these biofuels. I think we have planning to do some of that. And also as part of the 118 process, just the whole issue about what's sustainability, what's the definition of sustainability.

Support biofuel infrastructure and maybe high-level blends such as E-30 or B-20 type utilizations.

And then look at the possibility of production from biomass/coal mixtures with carbon capture and sequestration.

On the natural gas and propane side, there's an obvious need for product. There's one light-duty manufacturer in the marketplace. The others in the marketplace on the heavy-duty side there is one or two engines. There needs to be a broader range of engines available and different vehicle applications.

Continue the incentives for deployment of infrastructure and fleet vehicles. And finally, to fund some gas-to-liquids if you can get a greenhouse gas emission benefit out of it.

So, what are some of our takeaways? Next slide, please.

MS. MAGANA: Go ahead.

MR. JACKSON: We see that there's a considerable amount of investments that are being made worldwide in terms of the alternative fuels vehicle technology. We will continue to refine our estimates of current spending by federal, state agencies, as well as private industry. And perhaps private industry be taken a look at in more detail based on Mike Walsh's comments of China and Europe's investments here.

Will provide a more detailed breakdown of the current spending and we'll also give you some context for that spending relative to the authorizations that are in the farm bill and the 07 Energy Independence and Security Act, as well as the 05 EPAct.

There's some caveats on the current estimates. The current federal spending is probably the easiest one to find and categorize. State spending was an estimate based on the number of programs in place, and our estimate of what's being spent in California, and then ratio-ing that to the rest of the states, but not in the same proportion.

Private spending is very difficult to

estimate. Again, we believe that the aggregates global estimates we got are pretty good, but disaggregating it based on trends, we disaggregate those numbers based on trends and judgment.

And then finally, hopefully, these estimates will help develop the investment plan that the Commission is putting together.

Thanks for the attention. I'll take your questions.

MS. MAGANA: Tom Fulks.

MR. FULKS: Yeah, Tom Fulks here. I'm sorry that I'm going to have to, mike, back you up. Your slide number 5 it looks like, I tried to get a question when you were on that. Just wasn't able to get through here on the video conference.

MR. JACKSON: This is the one on state funding?

MR. FULKS: Yes. And what I'm going to do since I was unable to sort of break in, I'm going to just go down slide-by-slide and just do this really quickly. I've got to jump off the phone here real quickly, so I'll just go ahead and plow ahead.

Under the state breakout of spending there's two suggestions. One, I'd like to see a specific slide -- again, this is a suggestion, but I think it would be very helpful for everybody if we saw a specific slide on what exactly California is spending on these various power train technologies or fuel technologies, electric drive hydrogen, vehicle efficiency and so forth.

It's interesting that to aggregate all 50 states and see how they compare. Potentially put together a financial plan for the State of California. It would be very interesting and I think very helpful to see precisely what is California already doing in these various areas, what with the ZEV (inaudible) and all sorts of other things. That's number one.

Number two, I think it would be very interesting on the biofuels issue in particular just to see which states are the ones with the most money in the biofuels. And I have a feeling you're going to see they're coming from the cornbelt and the soybelt. Maybe some from the Pacific Northwest trying to develop fuel infrastructure.

But it would be very, I think, helpful to see perhaps the geographical motivation behind various state efforts to promote whatever it is, whatever they're promoting. Because I just don't think this slide is relevant to California in that we are not producing biofuels here in large volume.

Then secondly, on the private sector investment, I don't really have any questions on that other than again, under biofuels, are we talking about actual -- development, because, as I'm sure you know, you got literally hundreds of thousands of flex-fuel vehicles on the road already from General Motors, Chrysler and Ford.

And so are you including those flex-fuel vehicles in this commercialization category for private investment?

MR. JACKSON: I think the answer to that is no, I don't think the $100 incremental cost for those vehicles is included in this estimate.

MR. FULKS: Okay. Next slide, I'll just skip that one. And go to your slide number 8 under organizations. I noticed immediately that there was only one OEM in this mix, and that was Honda.

Seems to me that to round out your perspective of where the automakers are coming from you owe it to yourself and perhaps your client to at least make the effort to speak to a European auto manufacturer and an American auto manufacturer, just to get the full spectrum of what it is they are investing, what it is they see as barriers and everything else you're doing.

MR. JACKSON: Okay.

MR. FULKS: Then going on, under stakeholders who have identified actions. Under slide 11, under biofuels, I think that's -- from the industry standpoint that is a piece of work that would be welcome. Similarly, it seems to me that if you're going to be doing definitive studies on sustainability, including life cycle, land use and water and soil, I would really recommend you call for the same sort of scientific research into the full cycle impacts of battery production.

I'm talking lithium in particular. Because as far as I know, we don't have any environmental data on the impacts of lithium production for battery use on a large scale, that is. We may have some data on some of the smaller battery applications that are already in commercial use, but I don't think we have any projections in terms of full environmental impact and land use impact on a large-scale ramping up of lithium production.

And it would be also helpful to find out where that lithium production in the world is taking place.

MR. JACKSON: Yeah. This comment probably should go to all fuel pathways.

MR. FULKS: Well, I'm thinking but because this report, TIAX's recommendations is weighted so heavily toward electric drive, that if you're going to go that route you can't single out biofuels as alone for the -- study on sustainability. I think you really need to include the energy storage capability of your electric drive, which has undergone, as far as I know, none, or very little environmental scrutiny.

I think just in terms of credibility you may want to throw that in.

And those are my comments.

MR. JACKSON: Okay.

MR. FULKS: Thank you.

MS. MAGANA: Okay, next we have a question from Jon Van Bogart from CleanFuel USA.

MR. VAN BOGART: I had a couple comments and maybe a couple suggestions on how the state might be able to increase current production of alternative fuel vehicles and also expand vehicle offerings.

The changes in the investment plan are welcome. Really like the improvements in the plan, especially where it talks about CNG and propane vehicles. We believe these are two vehicle technologies that are here today, technologies, and I believe the industry is ready to advance those technologies. And that funding will help in that process, not only to speed up acceleration of current vehicle offerings, but expand additional offerings.

One of the market hurdles in the past has been the CARB certification of vehicles. CARB versus EPA and having to go through very expensive, two different processes. And so a suggestion would be that if ARB could engage EPA with industry interests to try and carve out and forge a process where we could have a simultaneous certification process, it would be one process and you could get 50-state certification.

This would also accelerate vehicle offerings and expanding vehicle offerings for both CNG and propane.

We're engaging automakers in a process to where they continue to produce vehicles off their assembly line on gasoline. And then those vehicles go over the fenceline to a factory upfitter. And then can be converted. Go back into the distribution system and delivered through a dealer network. This will also help that process.

I think we have seen the history of after-market kits out in the marketplace, and that really hasn't worked because a lot of these are niche market fleet vehicles, and they rely heavily on the dealerships for service and parts. And so this process would help us, as well, where we set up master dealers going and do the training.

I think why this is so important, the state's going to reach our 2020 20 percent reductions on time, I think the currently available technologies in the first few years of this program ar going to be critically important to getting the amount of vehicles out on the road to reduce consumption of both petroleum and also reduce emissions.

Let's see, I've got some other notes here. Both CNG and propane industry, like I had said, are engaging in OEM manufacturers, and with the rising fuel costs the way they are, fleets are coming to us in huge numbers, and they're also coming to General Motors and others, asking for these type of vehicles.

And so again we like the improvements to the investment plan, and we look forward to working with you and seeing even added improvements.

MS. MAGANA: Bonnie, you can go ahead.

MS. HOLMES-GEN: I just wanted to ask, Mike, did you collect any information or recommendations on levels of funding that were needed?

MR. JACKSON: No. Not at this point. I mean there is some of that out there. For example, National Research Committee, NRC, just published the hydrogen assessment as to what it needed to reach a implementation comparable to what we were talking about, that Gerry Bemis was talking about. So that report is out there.

That will be incorporated in, I'm sure the Commission will incorporate that.

MS. HOLMES-GEN: And what about the electric drive category? Is there anything of note?

MR. JACKSON: We previously did an analysis for the alternative fuels plan that looked at some of those numbers. They would need to be updated, Bonnie, but I believe --

MS. HOLMES-GEN: Okay. I'm just wondering, did you include organizations like the South Coast Air District?

MR. JACKSON: No. We looked at all the air districts, for example.

MS. HOLMES-GEN: Okay, I just didn't notice them. Thank you.

DR. SWEENEY: Can I just jump in here a moment. In the fall the National Research Council will release its study on alternative liquid fuels, which will go through in some real depth the technological opportunities and costs and other issues associated with alternative liquid fuels. That probably will be released late fall, early winter of this year.

It's part of the America's Energy Future overall study that the National Academy is doing. So that's something that will probably be worth looking into when it comes out.

MR. JACKSON: What's the definition,

Jim? Alternative liquid fuels?

DR. SWEENEY: It's basically looking at the biomass phased fuel cellulosic, as well as coal and liquid combinations -- coal and biomass combination fuel Fischer Tropsch type of synthesis process.

And those will be the ones that are detailed in the most depth. But it will be liquids that come from nonpetroleum sources.

Little look at the biofuels and all, as well; and a little look into some of the other sort of ways that bioengineering can design entirely different fuels from -- that are coming basically from biomass.

MS. MAGANA: Okay. Tim.

MR. OLSON: Mike, this is Tim Olson. Wondered if along the lines of Tom Fulks' comments, if you could break out the federal money dedicated to California. If that's possible to do that.

Also like to know in your analysis if you're looking at the effectiveness of these incentives, what are they producing?

And mostly your work looks like it's been kind of retroactive or up to date. What about projected other sources like potential utility ratebasing of electric storage or metering, that type of thing that might be home recharging?

MR. JACKSON: Yeah, that latter one, Tim, I mean what we're trying to do is find out what's being spent right now, as opposed to what could be done. But, good question.

MS. MAGANA: Okay, next we have Carla Din on the phone.

MS. DIN: I guess my comments are similarly about -- economy, and I'd appreciate it if you could comment about any more job creation. And I think this is the intention of staff to work on (inaudible) where there aren't direct greenhouse gas emissions reductions.

But I did want to relate my interest in a very indepth comprehensive look at different strategies for producing economic development in the state, with an eye towards job creation such as Etax by California -- switch values, the use of instate manufacturing equipment. And also to look at how we can attract new tech businesses and expand without being penalized under some of the tax structures. And as one of the barriers, examine other barriers that are preventing companies from locating here.

And also we encourage coordinating with the State Treasurer's Office and the California Business and Transportation -- agencies that are involved in similar programs.

MR. WARD: Thank you, Carla.

Since there are no other questions, Mike, thank you very much for your presentation. Maybe we'll be getting other comments in a written fashion into the docket. And I'm sure that work that we'll be doing in the future on the subject.

I just wanted to briefly bring everybody's attention to the new and revised implementation schedule for the investment plan. We, I think, have made good use of the month delay. I think it's -- and with the information we've been able to provide today.

Any question on this? The advisory committee has seen these dates already.

Okay, if you have difficulty pulling this up, it is in the docket right now. And as it projects it has both the rulemaking schedule and the investment plan schedule here. We've displayed both with the Energy Commission business meeting to adopt the investment plan on December 3rd at this point.

Our next meeting of the advisory committee formal will be October 6th. But we will be looking for another date for another more informal workshop with the advisory committee around September 15th, if the 15th is not going to be working readily.

MR. SMITH: Peter, if I might interject here, one possibility is September 19th. So if you could check your dates and check your calendars and see if that is a possibility.

MR. WARD: In order to make this schedule work, we would certainly like to receive all your comments if they're in written fashion, the sooner the better, especially if we're delaying this next workshop four days from the 15th to the 19th. If we can get your insight and advice on what you've seen today, speaking to the advisory committee primarily, but also our stakeholders and the general public, as well.

The sooner the better so that we can kind of jumpstart for the next workshop that we'll be having on the 15th - 19th week somewhere.

MS. HOLMES-GEN: Would you be

considering morning or afternoon, or are you unsure? It's a Friday, are you considering morning or afternoon?

MR. WARD: Oh, maybe an evening meeting on Friday.

(Laughter.)

MR. WARD: How would that be?

(Laughter.)

MR. WARD: No. We'll try to take that into consideration -- I think we're really going to start in the morning, for the most part, whether it's on a Monday or the Friday.

Any questions on the implementation schedule? No. Then, Chuck, would you like to go through the regulation.

MR. MIZUTANI: Chuck Mizutani. I think I'm the last one so I'll go very quickly.

What I wanted to do was to just provide a status on the rulemaking process with respect to this program.

On September 9th we're going to have a public workshop to review our draft sustainability regulations, as well as to come back on the other five items that we had discussed, or identified and discussed, at the August 11th workshop.

After the September 9th we're looking to receive written comments on not only the draft sustainability regulations, but also on the other regulatory language for the other five items on September 19th.

With that, we will be submitting our draft regulatory package to the Office of Administrative Law on October 7th, which then results in a October 17th notice of proposed action being posted.

And then on December 1st that ends the 45-day public comment and review period. Assuming that there is no significant comments that would require us to respond and add some additional time, basically a 15-day public comment and review period.

We would then be planning to go to a January 14th business meeting for approval. And then submitting our final package to the Office of Administrative Law for their 30-day review period, which would end March 2nd.

And then have the regulations published and go into effect on April 2nd. This assumes, again, no significant comments requiring some additional time.

Just sort of going back. On July 8th we had a Committee workshop in which we presented the ten steps for areas that we had identified that potentially could require rulemaking or regulatory language.

Based on our review at the July 8th workshop, we identified five areas that we believe require clarification or definition.

On August 11th we held a workshop on four of those areas, but not the sustainability goals which we had identified as needing some additional time and that we would be discussing at the September 9th workshop.

The four areas for additional regulatory language were defined as advanced vehicle technology, funding restrictions, the advisory committee and the investment plan.

And then where we're at now is on September 9th we are proposing to hopefully have a final comment period or comment on our draft regulatory language for the four areas. And then to present the regulatory language for the sustainability goals at the September 9th workshop.

The regulatory language, the revised

regulatory language for the four areas and the sustainability goal regulatory language have been posted. I think they were posted this past Friday. So, they're available on our web for review in preparation for the September 9th workshop.

That's it. Any questions?

MR. WARD: I'm mindful that everyone is probably fairly hungry. So, I have about 50 slides to go through, and I'll speak loudly to overcome the churning of your stomachs.

No, actually, I briefly wanted to just go through some of the work that has been happening in addition to the analysis that we've been performing here that you have seen.

We have been speaking with these entities, and I'm going to go through this very quickly. These are potential strategic alliances that we hope to strike with to actually leverage the impact of our money.

Some of these folks have been partners in the past; some will be partners in the future. We expect that these alliances will complement our dollars and vice versa, I think.

We have a whole host, and this is not a

complete list because it changes every day, of entities that have expressed interest in the program. This is more of an eye test than I had anticipated, but it is in your materials and you can look through it later. I think we have shown up on the radar at this point, and people are seeking us out.

I think it's important to note, though, that we are not engaging in full-time discussions about these, with these folks, about projects or anything like that, because the investment plan takes precedence. And we will hold those discussions after we have completed the investment plan with your advice.

These are other entities and fuel infrastructure and fleets and other consumers that have also expressed interest to us over the intervening time.

If nobody has any other questions? Oh, come on. Then I'd like to thank you all for your attendance, and for those that are on the phone, thank you for remaining silent.

We do have time for public comment, though. If anybody would like to step up and address the workshop at this time?

I see none, I hear none. So, again, thank you all for coming. And we'll be getting the information to you about the next staff and advisory committee workshop in the week of the 15th-19th of September.

Thanks for coming.

(Whereupon, at 1:13 p.m, the workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Staff Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of September, 2008.